

AMERICAN GAS ASSOCIATION MONTHLY

October 1928

Volume X

Number 10

The Value of Manufacturers' Organization

By OSCAR H. FOGG

Long-Distance Transmission of Gas

By HOWELL C. COOPER

1928 A. G. A. Convention Opens October 8

What Future for the Testing Laboratory?

By R. W. GALLAGHER

The Laboratory is the Acme of Public Service

By CARL SHULER

President Fogg Dedicates New Laboratory

Notes on Computation of Flue Losses

By GEORGE B. SHAWN

**First Manufacturers' Section Conference Is
Outstanding Success**

By A. G. A. STAFF MEMBER



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(Chicago, 1927)

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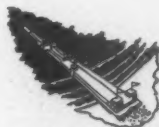
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**10th Annual
Convention
of the A. G. A.**

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Our Own Who's Who



XLI

Arthur Webster Thompson

BORN at Erie, Pa., May 3, 1875. Graduated from Allegheny College in 1897, with degree of civil engineer. Served a year as draftsman with Pittsburgh firm. Was instrument man with Pittsburgh & Lake Erie Railroad, and then chief of a party on surveys for Baltimore & Ohio R. R.

In 1900 became assistant division engineer of Baltimore & Ohio R. R., and advanced to various positions until in 1919 he was vice-president in charge of operations, traffic, engineering, and commercial development.

On June 1, 1918, was appointed Federal Manager by U. S. Railroad Administration for Baltimore & Ohio (Eastern Lines), Western Maryland Railway, Cumberland & Pennsylvania Railroad, Cumberland Valley Railroad, Coal and Coke Railway, Staten Island Lines in New York, Wheeling Terminal Railway.

On Feb. 1, 1919, became President of Philadelphia Co. and affiliated companies, including Duquesne Light Co. and Pittsburgh Railways Co., at Pittsburgh, Pa. On Sept. 1, 1926 was elected President of The United Gas Improvement Co., Philadelphia, Pa.

Is Chairman of Board of Philadelphia Electric Co., Philadelphia Gas Works Co., United Engineers & Constructors, Inc., and a director of American Gas Co., Consolidated Gas, Electric Light and Power Co. of Baltimore, Mohawk Hudson Power Corp., Pennsylvania Railroad, Pittsburgh Equitable Meter Co., Public Service Corp. of New Jersey, and subsidiaries, Welsbach Co., and several banks and other companies. He is President of the Philadelphia Suburban-Counties Gas & Electric Co.

Is member of Phi Beta Kappa, Sigma Xi. Has LL.D. from St. Johns College, LL.D. from University of Pittsburgh, and D.Sc. from University of Pennsylvania. Is chairman of Board of Trustees of Allegheny College.

AMERICAN GAS ASSOCIATION MONTHLY

Vol. X

OCTOBER, 1928

No. 10

1928 A. G. A. Convention Opens October 8 With More Than 5000 Executives and Representatives from the Manufactured and Natural Gas Industries

IT is already apparent that the big event of the gas man's year will be the Tenth Annual Convention of the American Gas Association which will be held on the Million Dollar Pier at Atlantic City, October 8 to 12. A record breaking attendance of 5,000 is expected to attend the sessions and visit the exhibition.

An imposing array of speakers will address the meetings on subjects of prime interest.

Hand in hand with the splendid programs of the various meetings goes the exhibition of appliances and equipment which will fill to overflowing the large Million Dollar Pier. This year the exhibition will be larger than ever and it is certain that manufacturers will show the latest developments in their fields of endeavor.

The tentative program as announced in the September issue of the MONTHLY is one of the most attractive ever offered to the gas industry. Practically the only recent change made in the General Sessions set-up has been the inclusion of an address, "Estimating Future Growth," by Carl Snyder, Statistician of the Federal Reserve Bank of New York. Since statistics are continuing to play an ever-growing part in the public utility industry, it is felt that Mr. Snyder will deliver a message of wide appeal.

ENTERTAINMENT

Entertainment features of more than usual attractiveness have been arranged. Members are requested to consult their



Atlantic City and the Million Dollar Pier—where all the gas men will be the week of October 8th.—at the A.G.A. convention



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K. A. Fisher



A. D. Little



H. B. Doran



F. N. McCarter



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A. H. Moore

Speakers at the General
Sessions at the
A. G. A. Convention
Atlantic City, N. J., Oct. 8-12

convention program immediately upon arrival.

CONVENTION MEETING ROOMS

An arrangement of special interest will be noticed this year. Every meeting will be held in a room sufficiently large to accommodate all who plan to attend. The meetings of the various departments and sections will be held in the best quarters available in Atlantic City. The following are the locations of the afternoon meetings:

Natural Gas Department, Belvedere Room, Hotel Traymore.

Accounting Section, Vernon Room, Haddon Hall.

Commercial Section, Greek Temple, Million Dollar Pier.

Industrial Gas Section, Rose Room, Hotel Traymore.

Publicity and Advertising Section, Belvedere Room, Hotel Traymore.

Manufacturers' Section—Greek Temple, Million Dollar Pier.

Technical Section, Hippodrome, Million Dollar Pier.

STEEL TREATERS' SHOW

Because the American Society for Steel Treating is holding a special "Gas Day" at its Philadelphia Convention the day after the A. G. A. convention at Atlantic City, it is expected that a great many delegates will go to Philadelphia to attend the sessions of this important national organization, and to go through their large exhibition. R. G. Guthrie, of The Peoples Gas Light & Coke Co., is to deliver an address on this "Gas Day," which is to be held on October 12. The title of Mr. Guthrie's address will be "The Effect of Furnace Atmospheres on Steels."

A feature of interest at the Steel Treaters' Show will be the exhibition of the American Gas Association as noted elsewhere in this issue.

FINANCIAL SYMPOSIUM

Under the auspices of the Publicity and Advertising Section of the Association



Miss Dorothy Speare, famous American soprano, will be at her best at the annual evening meeting of the A.G.A. convention. Her selections, as well as music by George Olsen's orchestra and an address by George B. Cortelyou, will be broadcast over a nationwide network

there will be held on Wednesday afternoon, October 10, a symposium on the financial aspects of the gas industry. This meeting will be the first ever conducted on this subject, and has for its principal purpose the making of closer contacts with the financial press and security houses.

Arthur S. Dewing, Professor, Graduate School of Business Administration, Harvard University, will be the first speaker at this symposium. His address will be entitled "Holding Company Finance From the Point of View of the Operator." Professor Dewing is well known in collegiate circles, and he is also a prominent public utility operator.

Owen A. Conner, financial editor of the *Public Ledger*, Philadelphia, Pa., will have for his subject "The Dividing Line Between News and Advertising." Mr. Conner is one of the foremost financial writers of the day and a keen student of conditions affecting modern industrial progress.

Judge H. O. Caster, member of the Executive Committee of Henry L. Doherty & Company, will present an address on "Natural Gas Developments of Interest to the Investor," in which he will point out the high spots of this great industry which is going ahead at record-breaking speed. Judge Caster will paint the picture of progress for the natural gas industry.

"What the Gas Industry Should Know About the Investing Public" is the subject to be covered by Wm. A. Pennington,

A. G. A. Officers



President Oscar H. Fogg



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E. Paige*



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*Vice-president Ber-
nard J. Mullaney*



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*Managing Director
Alexander Forward*

The annual address of the president and the reports of the treasurer and managing director will be given at the convention

of the Utility Securities Company, Chicago, Ill. This address will be a new slant on a problem of almost universal appeal.

NATURAL GAS DEPARTMENT

Samuel W. Meals, chairman of the Natural Gas Department, has scheduled a meeting of the Advisory and Managing Committees of his Department for Tuesday noon, October 9. This will be followed by a special conference of natural gas men.

ACCOUNTING SECTION

The Accounting Section will have three very important sessions at which committee reports will play an important part. This section has a well-deserved reputation for committee organization and its reports this year are of the usual high calibre.

COMMERCIAL SECTION

Addresses of practical value will constitute the three sessions of the Commercial Section. Every phase of the commercial activities will be covered and it is quite apparent that commercial men will take great interest in this 1928 meeting.

MANUFACTURERS SECTION

The sessions of this Section will consist of an open forum or symposium on important subjects of interest to manufacturers as related to the gas industry.

TECHNICAL SECTION

An interesting array of addresses and committee reports will feature the Technical sessions at the convention. Subjects of interest to both manufactured and natural gas men will be covered and a record-breaking attendance is predicted for this meeting.

INDUSTRIAL GAS SECTION

This section will also have a program consisting of addresses and reports. The Industrial Gas Section committees have had a particularly active year and the reports of these committees cover important and vital subjects. Addresses on high spots will be given by men well qualified to address the meeting.

WOMEN'S MEETING

At a special Meeting of the Women of the industry, to be held on Tuesday afternoon, October 9, in the Hotel Dennis, the following addresses will be given:

*J. J. Burns**H. L. Whitelaw**W. C. Beckjord**E. F. Gardiner**Edward Porter**S. W. Meals**F. C. Mackey*

Sectional vice-presidents of the A. G. A. who will preside at meetings of their respective departments and sections

"The Part Every Utility Employee Plays in Rendering Utility Service," by Miss Sara Harris, Utica Gas and Electric Co., Utica, N. Y.

"Advertising in a Public Utility," by Miss Clara H. Zillessen, Philadelphia Suburban-Counties Gas and Electric Co., Philadelphia, Pa.

"Home Service," by Miss Ada Bessie Swann, The Public Service Electric and Gas Co., Newark, N. J.

"Opportunities for Women in Business," by Miss Julianne Doane, The Peoples Gas Light and Coke Co., Chicago, Ill.

Miss R. G. Stone, editor of the *Ohio Gas and Oil Men's Association Journal*, will preside at the meeting.

A large attendance is expected at this meeting.

GENERAL

The members are requested to consult their official convention programs for all convention details.

The registration fee for members will be the same as it has been in the past, \$2. Registration for non-members will be \$3. Register early and avoid the rush.

Peters Heads Metropolitan Industrial Men

AT the first meeting of the Metropolitan Industrial Gas Sales Council for the 1928-29 season, the following officers were elected: chairman, A. J. Peters; vice-chairman, A. J. Sutton; secretary and treasurer, C. E. Muehlberg.

The meeting was held at the Consolidated Gas Company Building in New York and the following companies were represented: Consolidated Gas Company of New York, Westchester Lighting Company, The Brooklyn Union Gas Company, New York & Richmond Gas Company and The Public Service Electric & Gas Company.



W. G. Gribbel



C. W. Berghorn



H. L. Whitelaw



J. D. Taylor

Members of the Committee in charge of the Annual Exhibition

The Exhibition Committee consists of H. Leigh Whitelaw, Chairman; C. W. Berghorn, director of exhibits; W. G. Gribbel, W. L. Schaeffer, J. D. Taylor, F. H. Knapp, and Wm. DeFreitas, assistant director of exhibits.



Wm. DeFreitas

A. G. A. Convention Session "Goes on the Air"

Evening Meeting Will Be Broadcast Over Blue Network of the National Broadcasting Company

GAS men unable to attend the tenth annual convention of the American Gas Association, at Atlantic City, N. J., Oct. 8 to 12, will be interested in the announcement that the evening session will be broadcast over a nationwide network of radio stations at 9:30, Wednesday, Oct. 10.

The program to be broadcast consists of songs by Miss Dorothy Speare and music by George Olsen's orchestra. George B. Cortelyou, President of the Consolidated Gas Co. of New York, and chairman of the Joint Committee of National Utility Associations, will deliver an address entitled, "The Ultimate Test."

The key station in the hook-up will be WJZ, of New York, N. Y. Station WPG, of Atlantic City, N. J., will also carry the program. It is impossible at this time to give members a correct list of

stations which will be in the hook-up, but it is certain that there will be representative stations in every section of the country.

Those who are interested in "listening in" are requested to consult their daily papers for announcement of stations in their territory which will carry the A.G.A. program.

The stations in the Blue Network of the National Broadcasting Co., are:

WJZ, New York, N. Y.
WBZA, Boston, Mass.
WBZ, Springfield, Mass.
WBAL, Baltimore, Md.
WHAM, Rochester, N. Y.
KDKA, Pittsburgh, Pa.
WJR, Detroit, Mich.
WLW, Cincinnati, Ohio.
KYW, Chicago, Ill.
KWK, St. Louis, Mo.
WREN, Kansas City, Mo.

Many Gas Men Will Attend "Gas Day" at Steel Treaters' Convention

To Be Held in Philadelphia on Friday, October 12, Day Following A. G. A. Convention in Atlantic City



D. W. Chapman

WHAT will in effect be an adjournment of the American Gas Association Convention from Atlantic City, N. J., to Philadelphia, Pa., will take place on the day following the A. G. A. meeting, Friday, Oct. 12.

It is already apparent that many gas men, in making their itinerary for the convention trip, have arranged to go to Philadelphia to attend the Friday session of the annual convention of the American Society for Steel Treating, which is convening in the Pennsylvania city the same week the A. G. A. meets.

Friday, Oct. 12, will be a "gas day" at the Steel Treaters' meeting. R. G. Guthrie, of The Peoples Gas Light and Coke Co., Chicago, Ill., will present a paper at the Steel Treaters' sessions, and there will also be other papers of real interest and value to the industrial gas man and the gas executive.

In addition there will be at the Steel Treaters' exhibition, the large exhibit of the American Gas Association. This will occupy about 10,000 sq.ft. of space, and six manufacturers of industrial gas equipment will show the newest and most up-to-date products. The A. G. A. exhibit at previous Steel Treaters' shows has been a feature of the entire exhibition, and this year will be no exception.

The A. G. A. exhibit is under the direction of the Committee on Display and Contact with National Industrial Organizations, of the Industrial Gas Section. D. W. Chapman, of The Peoples Gas

Light and Coke Co., Chicago, Ill., is chairman.

Many gas men are going to take advantage of this opportunity to see the Steel Treaters' exhibition, to hear the papers on gas and allied subjects, and to establish contact with the large industry the American Society for Steel Treating represents.

The A. G. A. exhibit in the Philadelphia Commercial Museum will be occupied by the American Gas Furnace Company, the Eclipse Fuel Engineering Company, the Surface Combustion Company, Sullivan Machinery Company, Alex. Milburn Co., and Gehrnich Indirect Oven Co. All furnaces will be in actual operation, and a metallurgical control laboratory, in charge of an experienced metallurgist, will be available to assist in demonstrating that quality of production is inseparably linked to proper heat treatment conducted in modern gas furnaces.

The American Gas Association will have an attractive booth in charge of representatives, who will supply literature and furnish any information in regard to the gas industry which may be of interest to visitors.

A special effort will be made this year to improve on the general attractiveness of the gas furnace display and Raymond M. Martin, of the Consolidated Gas Company of New York, will assist in planning the arrangement of exhibits.

The Philadelphia Gas Works Company is represented on the committee which has the exposition in charge by H. S. Christman, to whom much credit is due for his untiring effort in the interest of the exposition.

It appears that few will desire to miss the unusual opportunity afforded this year, and it is confidently expected that the previous attendance records at annual meetings of these two associations will be eclipsed.

Members of the committee in charge are:

D. W. Chapman, chairman, The Peoples Gas Light and Coke Co., Chicago, Ill.

E. M. Rowand, Jr., vice-chairman, Philadelphia Suburban Counties Gas & Electric Co., Norristown, Pa.

A. M. Apmann, Consolidated Gas Company of N. Y., New York, N. Y.

R. B. Burr, Logan Gas Company, Columbus, Ohio.

H. S. Christman, United Gas Improvement Co., Philadelphia, Pa.

E. B. Dunkak, C. M. Kemp Manufacturing Co., Baltimore, Md.

Peoples Company Gas Sales Continue to Grow

A RECENT stockholder's bulletin of The Peoples Gas Light and Coke Co., Chicago, Ill., contains the following paragraphs on the increasing sales of gas in the territory supplied by the company:

"Steady increases in gas sales have been made since the beginning of the year. Volume use of gas, which is the most desirable type of load, is the use that is growing most rapidly.

"Each month a substantial increase in industrial gas sales has been made over the same month of 1927. Sales in May for strictly industrial purposes amounted to 434,-

772,000 cubic feet, an increase of more than 16 per cent over May of 1927 and was the largest single month's business in the industrial department.

"In April this year, when the new reduced rate schedules went into effect, a new industrial schedule also was filed. Within a period of three months, 168 industrial customers have changed to this new classification, bringing a wider potential use of gas.

"Many smaller customers who have previously been unable to avail themselves of industrial rates now find it possible to adopt this classification advantageously. This tends to stabilize our industrial business besides enabling gas to invade fields now being supplied by other fuels."

Special Train Service for Tulsa Petroleum Exposition

SPECIAL train service will be arranged for those attending the International Petroleum Exposition, to be held at Tulsa, Okla., Oct. 20-29, according to an announcement made by A. F. Winn, chairman of the special trains committee.

The committee is undertaking to build up and concentrate the travel to sufficient proportions to justify special train service, the plan being to operate specials from such originating and gateway centers as New York, Los Angeles, and Houston, over the more direct trunk lines and connections into Tulsa, coordinating with the movement of these trains all tributary travel.

Those desiring further information should write to Mr. Winn, manager, Traffic Department, Skelly Oil Co., Tulsa, Okla.



Meeting of the Executive Board held in the new Testing Laboratory building, at Cleveland, Ohio, on Sept. 13. This was the first official meeting to be held in the building



President Fogg unveils the dedication tablet in the new laboratory

President Fogg Dedicates New Laboratory

Epecially Fine Building is Dedicated to Promote Gas Industry and Better Public Service

DEDICATED to promote and develop the gas industry to the end that it may serve to the fullest possible extent the best interests of the public," the new American Gas Association Testing Laboratory at Cleveland, Ohio, is without doubt the most conspicuous enterprise ever undertaken by any industry in the interests of its public.

Oscar H. Fogg, President of the A. G. A., unveiled a dedication tablet at the new building on Sept. 13 at special exercises attended by more than 100 leading executives, and the usefulness and service of the laboratory to the industry and to the 75,000,000 users of gas service will be measured from that time.

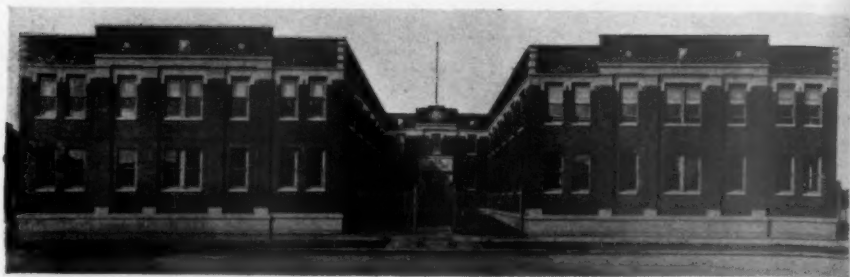
J. G. Clark, engineer of research and training, The London Gas Light and Coke Co., London, England; R. W. Gallagher, President of The East Ohio Gas Co., Cleveland, Ohio; and Carl Shuler, director of law for the City of Cleveland, were the speakers at a special luncheon held immediately after the unveiling ceremonies.

In unveiling the tablet, Col. Fogg said:

"Nothing could have been more happy, nor more fitting, than the action of the Laboratory Managing Committee in selecting for the inscription of this tablet, a quotation from the Constitution of the American Gas Association, setting forth that this building is dedicated to promote and develop the gas industry, to the end that it may serve to the fullest possible extent, the best interests of the public. It is in no sense a commercial enterprise. It is the tangible expression of the industry's allegiance to the principle that its greatest progress will be made through providing the best possible service to the American people.

"This structure, with its equipment, was initiated, erected, paid for and sponsored and will be controlled by the organized gas industry of North America, made up of gas companies, manufacturer companies, and individuals. This dedication and inscription link permanently the Association and the Laboratory in a common cause and common purpose.

"In the three years since the inception of the undertaking, I find but one criticism to make of the Managing Committee. It is that in my absence from the scene of action they inserted upon this tablet the names of the officers of the Association instead of the names of the Committee which with such earnest purpose, such unflinching attention and such marked suc-



The new Testing Laboratory building is a most modern and well-equipped gas appliance testing research laboratory

cess has guided the Laboratory through the years of period of organization, through the time of its development and to its present point of adequate equipment in the service of the industry. I propose, therefore, as the names of honor, those of Ralph W. Gallagher, R. B. Harper, J. S. DeHart, Jr., Arthur H. Hall, N. T. Sellman, and R. M. Conner, who, from the beginning, has been its efficient Director.

"It is a pleasure to add that George E. Whitwell is just bringing to this work his long experience and enthusiastic energies.

"Therefore, to promote and develop the gas industry to the end that it may serve to the fullest possible extent the best interests of the public, this building is dedicated on behalf of the officers, the Executive Board, and the members of the American Gas Association."

Mr. Gallagher, chairman of the Laboratory Managing Committee, presided at the luncheon. He reviewed highspots in the history of the laboratory, and said:

"Although a few who conceived the idea of a laboratory building had some conception of the possibilities that the laboratory held for the gas industry as a whole, I am rather doubtful whether two years ago any of us anticipated such possibilities as we have today.

"The staff has done wonderful work with limited facilities. That they functioned as well as they did, and that they gave us results which were uniformly good, has brought about the possibilities of this larger and more efficient laboratory we have here today. I cannot say too much of R. M. Conner, the Laboratory director, and his staff of assistants."

Mr. Gallagher also gave some interesting figures about the Testing Laboratory. He said that since the Laboratory was started two and a half years ago, 258 water heaters, 281 furnaces and boilers, 838 space heaters, and 9500 stoves and

ranges—a total of some 11,000 gas appliances—have been approved. Laboratory inspectors have travelled 25,000 miles.

"I believe that the method by which the laboratory functions might be best described by the way in which it has helped the manufacturers," Mr. Gallagher continued. "On 98 per cent of the appliances which have come into the laboratory for inspection and tests, there have been some suggestions made which we think have benefited the appliances and of necessity the manufacturers and the gas consuming public.

"The mixed gas research work, which was turned over to the laboratory about a year



The dedication tablet



More than 100 were present at the luncheon held immediately after the dedication ceremonies of the new Laboratory building

ago, is well under way. There have been some 50,000 tests made on mixed gas in order to work out a comprehensive report for the committee for whom we are conducting this work. I might say that this investigation is not completed and the probabilities are that there will be at least twice as much work yet to accomplish, but what I have just mentioned gives you some idea of the great amount of work which can be accomplished and should be accomplished in connection with the gas industry.

"This laboratory is well equipped to carry on any work which the Board may desire to entrust to it. I think we will all agree that as an industry, our growth in the past has been due to the great many things which have been developed for us to work with and if that is continued in the future, we do not see why there should not be a further remarkable growth. This laboratory is only the beginning of the helpfulness which may be rendered to the gas industry generally.

"The number of manufacturers making approved appliances increased last year to 70 per cent, so it is evident that the laboratory is drawing the manufacturers to it because they realize the help that they can receive from its investigations.

"We are all, of course, tremendously proud of the building which you have furnished the staff. I assure you that everything will be done by the Managing Committee and by the staff to warrant the generous cooperation which you have extended to us."

Col. Fogg made a brief address, and then called upon a member of the Association's Executive Board to make a motion that a tablet be prepared to include the names of the Managing Committee of

the Laboratory. The motion was made and passed.

Carl Shuler, director of law of the City of Cleveland, made a stirring address in which he complimented the gas industry on the beautiful and efficient building it had erected. His remarks are printed elsewhere in this issue.

J. G. Clark, engineer of research and training, London Gas Light and Coke Co., London, England, was the concluding speaker at the luncheon. After extending greetings from the British gas industry, Mr. Clark said:

"It is well and often said that science has no frontiers and I always feel that the gas industry is an important branch of science and has no frontiers.

"That inscription indicates to me that perhaps we on the other side of the water may get a few crumbs of useful information from you and I can assure you we will not fail to take advantage of it.

"I have had the good fortune of looking over this institution somewhat in detail, and I was struck at once with the fact that your problems are similar to ours. We feel that we have a very good commodity to sell—gas. It is one of the finest fuels the world has ever known when it is used properly. It is efficient, economical, safe and healthy with proper use. That brings us to the whole crux of the problem—when it is used properly."

Following the formal exercises there was an inspection trip of the new building.

The Executive Board of the Associa-



Testing engineers conducting efficiency and combustion tests on ranges in the new laboratory



Water heater testing in progress in new building of the A.G.A. Testing Laboratory



Conducting efficiency test on gas-fired warm air furnace in central house heating section



Chemical section of the new laboratory, showing various pieces of equipment and apparatus

tion held the first meeting in the new building the morning of the 13th, and this was followed on the 14th by the first conference of the Manufacturers' Section.

Details of the laboratory building are given in other articles in this issue.

The members of the Managing Committee of the Testing Laboratory are:

R. W. Gallagher, Chairman, East Ohio Gas Co., Cleveland, Ohio.

R. M. Conner, A.G.A. Testing Laboratory, Cleveland, Ohio.

J. S. DeHart, Jr., Isbell-Porter Co., Newark, N. J.

R. B. Harper, The Peoples Gas Light & Coke Co., Chicago, Ill.

N. T. Sellman, Consolidated Gas Co. of New York, New York, N. Y.

G. E. Whitwell, Equitable Gas Co., Pittsburgh, Pa.

Industrial Trend

Editorial in Riverside, N. J., Press

A COURSE for gas salesmen, dealing with various phases of the economic problems of industrial gas distribution, is to be given at the school of commerce, New York University, according to an announcement by the American Gas Association.

This is indicative of the modern trend of industrial education. Industry has learned to be dissatisfied with the sort of employee who is interested only in his pay check. Instead it is hiring men who are eager for a real insight and interest in the business.

This particular course will include salesmanship, factory economics, production systems, industrial organization and other fields. Sessions in industrial heating, market analysis, and the use of gas in relation to competitive fuels will be given. The result will be salesmen infinitely better fitted to serve the public and the industry.

What Future for the Testing Laboratory

Its Past Record Presages An Era in Which It Will Play Even More Important Roles

By R. W. GALLAGHER

Chairman, A. G. A. Testing Laboratory Managing Committee

OUR industry will welcome with interest the news that it now has available a splendidly equipped gas appliance testing and research laboratory, dedicated to the improvement and promotion of the utilization of its product. Probably the best

proof that this institution is fulfilling an essential purpose is the fact that more than 98 per cent of all the appliances listed by it have been changed in some respect.

Approximately 160 manufacturers are now producing approved appliances and more than 40 others have submitted their equipment for test. While there are many more manufacturers than the total of these two numbers, the Laboratory has been fortunate in securing the coopera-



Testing gas refrigerators in the new building of the A.G.A. Testing Laboratory

tion of practically all of the larger ones. As a result, it is estimated that about 50 per cent of the furnaces and boilers, 50 per cent of the water heaters, 60 per cent of the space heaters, and 75 per cent of all the gas ranges manufactured during the present year will carry the A. G. A. Testing

Laboratory mark of approval.

More than 11,000 different models of appliances now bear the Laboratory's approval seal and it is estimated that the total number of approved appliances sold during the year 1928 will exceed one million. Notwithstanding these facts, there are still thousands to be tested. It seems, however, that there is now an ample number of approved gas ranges, water heaters, space heaters, boilers and



Engineers conducting tests on domestic and industrial gas appliances in the mixed gas research program as carried out in the new Laboratory



Three 5,000 cu.ft. holders, booster and purifier houses are part of the Laboratory's outdoor equipment

furnaces so that any gas company or appliance dealer may logically confine such sales exclusively to approved appliances.

The electrical industry has been very fortunate, indeed, in having within its ranks such research organizations as those maintained by the General Electric Company and the Westinghouse Electric Company. Both of these agencies have played a most important part in the development of the electric business and, as such, are entitled to no small credit for its present measure of success. Both of them, however, are organized for profit and are primarily interested in furthering their own interests rather than those of all manufacturers, as is the case with our own testing establishment. Consequently, I do not believe that it is expecting too much of our Testing Laboratory to eventually fill a field of usefulness equal to if not greater than that occupied by either one of these organizations.

At the present time the Laboratory is assisting in the solution of one of the gas industry's foremost technical and economic problems by its research on the mixing of gases. Allowable changes in controlling factors are being studied and some definite findings have already been obtained on gravity and heating value variations. To date, more than 50,000 separate tests have been completed in this study, the results of which will be reported at our next annual convention.

While the Laboratory has made notable achievements as a result of its appliance

(Continued on page 634)

Booklet Lists Advantages of Research in Sales Analysis

A BOOKLET entitled "The Use of Research in Sales Analysis," which is part of a study prepared for the Research Committee of the New England Council by the Policyholders Service Bureau of the Metropolitan Life Insurance Co., lists the following as the advantages of sales analysis:

Control of Sales Activities—The chief advantage to be derived from sales analysis, according to the Bridgeport Brass Company, is better control of sales activities. In these days, any sales organization which operates without some controlling machinery for sales and expense, usually wakes up about the time the crash comes. But with proper records and analysis, steps can be taken to correct any tendency toward increased expenses or decreased sales by territories, by customers, and by salesmen before it has gone far enough to affect the business.

Avoiding Excessive Stocks—The National Blank Book Company of Holyoke, Mass., believes that, through sales analysis records, market and stock production can be kept well in hand so that at no time is there an excessive stock of a certain item nor does any item run out of stock when needed.

Helps Sales Direction—From sales analysis records, Henry G. Thompson and Son Company of New Haven, Conn., manufacturers of hack saws and frames, find that it is easy to analyze the condition of sales and to locate weak territories as well as those which are progressing satisfactorily. These records are of much importance as they supply all the necessary information required to give intelligent direction to the company's sales efforts.

Instruction and Stimulation of Salesmen—From the tabulation of sales results, Eaton, Crane and Pike Company of Pittsfield, Mass., manufacturers of fine writing papers, is able to advise, instruct and stimulate its men, and place sales promotion work on an effectively functioning basis. From the tabulation of sales of individual items, this company is able to tell whether the salesmen are giving proper distribution to the various items, and to apply necessary measures to correct any undesirable situation which may exist.

H. G. Burton, assistant to the president of the Walworth Company, Boston, Mass., manufacturers of valves, fittings and tools, summarizes the advantages to be derived from sales analysis as follows:

1. Detailed knowledge of just what lines are being sold.
2. Where the product is going.
3. What salesmen are selling the various classes of material.
4. Computation of the salesmen's commissions.
5. Decided asset to the branch managers in keeping track of sales on the various items.

New Laboratory Building Makes Possible Increased Service to Industry

By R. M. CONNER

Director, A. G. A. Testing Laboratory, Cleveland, Ohio



R. M. Conner

A LONG reign of useful service to the gas industry and to the public was started with the opening of the American Gas Association's new Testing Laboratory on September 13. We may manufacture and supply a perfect gas at a uniform pressure; our office staff and field men may be all that could be desired from the standpoint of competency and courtesy; yet, if our customers' appliances are unsafe and do not give convenient and efficient service, gas as a domestic fuel for the nation will not make as rapid progress as it deserves.

The new Testing Laboratory is the finest and most complete establishment of its kind in the world. It provides roughly 3,200 sq. ft. of office space, 8,700 sq. ft. for appliance storage and 14,700 sq. ft. for appliance testing and research. It is a two-story brick building with basement and is of fire-proof construction throughout. It was designed by the Osborn Engineering Company, of Cleve-

land, Ohio, which engineered, among other important structures, the University of Michigan Stadium, the Yankee Stadium in New York City, and the Firestone Tire and Rubber Company's Akron, Ohio, plant. The style of architecture is institutional.

Each testing department is now quite spacious, providing room for future expansion if desired. Directly in the rear of the new building and on the Association's property are located three 5,000 cu. ft. holders, compressor, and booster house, and gas purifying equipment. Here, as in other places, room for expansion has also been provided. Before the end of the next fiscal year, it is anticipated that another 5,000 cu. ft. holder will be erected. These holders and the entire building are heated by a gas-fired steam boiler of an approved type. Gas-fired machines will supply the refrigeration requirements of the new building and it is planned in the near future to construct a constant temperature room for testing devices of this type.

Our added testing facilities will increase the Laboratory's potential testing capacity over former conditions by ap-



Space heater set-up in 1,000 cu. ft. air tight test room and CO recorder in the new building



Conducting efficiency and combustion tests on space heaters in one section of the Laboratory



The staff of the American Gas Association Testing Laboratory, Cleveland, Ohio

proximately three times. They will permit the expansion of our present domestic gas appliance testing program to include examinations of clothes dryers, gas-heated irons, ironers, incinerators, refrigerators, garage heaters, and hotel appliances as soon as requirements for equipment of this kind have been prepared.

Insofar as is possible, all of the Laboratory's testing equipment is automatic, thus eliminating the personal equation from the results and resulting in a saving in man power.

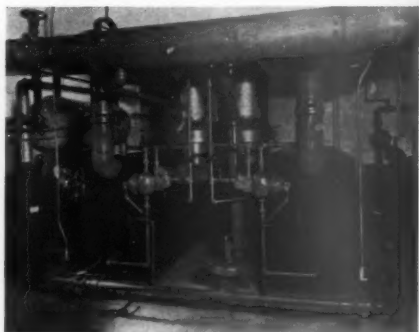
A rather general impression that seems to prevail in the industry is that after testing is begun on any particular type of appliance, practically all such work will be completed within a relatively short time. This, however, is not the case for all of the major testing programs, once started, continue indefinitely. Take, for example, the Laboratory's experience in the gas range department. The Laboratory began the examination of gas ranges considerably over two years ago, and at the present time there is fully as much of this business as ever before. New models that are being submitted with regularity keep every established department operating at full capacity practically all the time. Our Laboratory is now serving more than 200 appliance manufacturers including the largest and most progressive in each field. As this number increases, it is only reasonable to

assume that the amount of testing business will likewise increase. When planned, the new Laboratory was designed to accommodate the gas industry's appliance testing and research requirements for some five years in advance.

A new feature of particular interest to every appliance manufacturer is three large testing and development rooms which have been provided for his use. All of these rooms are supplied with three different kinds of gas, hot and cold water connections, and compressed air. They are also equipped with the most modern types of appliance testing apparatus, so that, if the manufacturer desires, he may install his appliances and make necessary adjustments or conduct preliminary tests on them before submitting them to the Laboratory for approval test.

The Association's new Testing Laboratory will provide more than three times the testing space formerly available at its old quarters; being especially designed for the purpose, it will be much more convenient and consequently, should increase the operating efficiency considerably. It is equipped with the most modern type of testing apparatus available and manned by the best testing staff that can be secured. All members of the testing staff are graduates of leading colleges or universities in the United States.

(Continued on page 632)



Of course gas is used for heating the new Laboratory building—and for supplying hot water as well

Notes on the Computation of Flue Losses

With Comments on the Subject and An Outline of the Method Used at the A. G. A. Laboratory

By **GEORGE B. SHAWN**

Supervisor, A. G. A. Testing Laboratory, Cleveland, Ohio



G. B. Shawn

IN the examination of gas appliances for efficiency a determination of flue or stack losses is usually made. This determination is important not only because it may show that the efficiency of the appliance can be improved by a reduction of the flue losses, but also because the radiation and convection losses from exposed surfaces are usually computed from the totals of efficiency and flue losses. Several methods of computing flue losses are in general use, and these methods are not in agreement, particularly in respect to the heat loss through water vapor formed during combustion of the gas. These discrepancies in computation have lead to the preparation of the following comments on the subject and the outline of the method employed at the A.G.A. Testing Laboratory.

Efficiency tests do not yield absolute results, but serve only as a comparison, as a heat interchanger, of the appliance under test with the gas calorimeter. The difference between a water heater, for instance, and a Junkers calorimeter lies in the more complete heat absorption by water flowing through the calorimeter. In this case flue losses, as well as radiation and convection losses, have been reduced to a negligible amount. With regard to flue losses from the water heater, then, it seems logical to base our determination on the heat which would have been recovered if the flue gases had followed the same conditions of temperature as those which occur in the calorimeter. Let us therefore consider

the conditions to which the calorimeter flue gases are subjected.

During combustion of the fuel gas, air combines in the combustion chamber with the hydrogen and carbon of the gas forming water vapor and carbon dioxide. These gases, accompanied by the nitrogen remaining from the combustion air and by some excess air, leave the combustion chamber at a high temperature. On passing over the heating surfaces the flue gases give up their heat and their temperature is reduced in proportion to the heat given up except in the case of water vapor. If the water vapor is condensed to a liquid, heat is recovered due to the change in state. The heat given up during a change in temperature is known as sensible heat, that during a change from vapor to liquid as latent heat. Here lies the greatest difference between the calorimeter and the usual gas appliance, for practically all of the water vapor is condensed in the calorimeter and seldom any in the practical appliance. During the cooling of the flue gases, the water exists first in the form of a vapor, then is condensed giving up its latent heat, and is finally cooled to room temperature in the liquid state.

It should not be supposed that condensation of all the water vapor occurs at any given temperature of the flue gases. The temperature at which condensation will take place depends upon the proportion of water vapor in the flue gases, and consequently as the water vapor is condensed, the condensation temperature is gradually lowered. Figure 1 shows the amount of water vapor left uncondensed as the temperature of the flue gases is lowered. (These figures are taken from analysis of the flue gases of a calorimeter during a heating value determination.) The heat

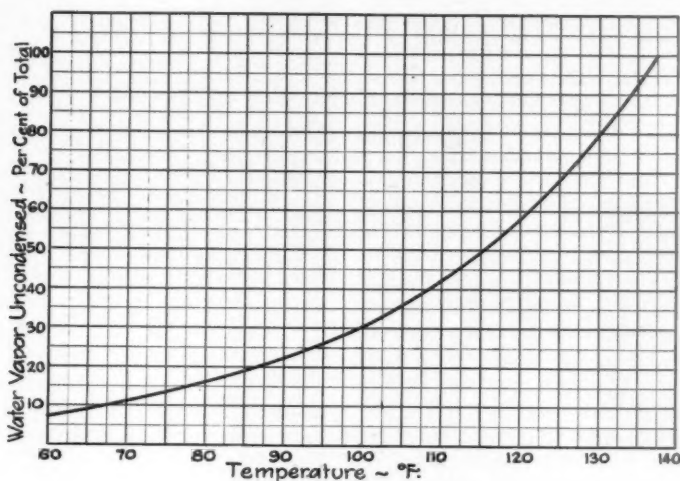


Fig. 1

given up during condensation of the water vapor varies with the temperature, being higher with the lower temperatures, and the specific heat of water is higher in the liquid state than in the vapor. Applying these points to flue loss determination, we see that the results are likely to depend upon the temperature at which we consider the change from liquid to vapor to take place. By actual calculation in the case of the calorimeter flue analysis mentioned above it appears that there is little difference whether we consider the water vapor as a gas from room temperature upward or whether we compute the heat content as a liquid below the actual condensing point and as a gas at higher temperatures. This is true, of course, only if the latent heat of steam is taken as at room temperature in the first case.

A comparison of four methods of computation of heat loss from water vapor will now be made. First, however, let us select a representative flue gas analysis as an example, viz:

CO ₂	8.8%	
O ₂	5.0%	Flue temperature—350°
N ₂	86.2%	Room temperature—70°

The analysis of the fuel gas together

with the oxygen requirements and combustion data are given below:

Fuel Gas Analysis Component	Amount Cu.Ft.	O ₂ Required for Combustion Cu.Ft.	Combustion Gases—Cu.ft.		
			CO ₂	H ₂ O	N ₂
CO ₂	.047		.047		
III. 1C ₃ H ₈	.034	.128	.102	.076	.484
3C ₂ H ₄					
O ₂	.009	— .009			— .034
H ₂	.536	.268		.536	1.014
CO	.062	.031	.062		.117
CH ₄	.283	.566	.283	.566	2.141
C ₂ H ₆	.000				
N ₂	.029				.029
Total	1.00	.984	.494	1.178	3.751

Total volume of dry products (CO₂ + N₂) = 4.245.

Ultimate CO₂ — % = $\frac{.494}{4.245} \times 100 = 11.63$

The flue gas analysis shows that excess air constitutes 23.9% of the dry gases or $\frac{23.9}{76.1} \times 5.423 = 1.705$ cu.ft. per cu.ft. of gas burned. We may then list the volumes of flue gases.

CO₂ = 0.494 cu.ft.
N₂ = 3.751 cu.ft.

H₂O = 1.178 cu.ft.
Air = 1.705 cu.ft.

To determine the heat loss from the dry gases we have only to multiply the volume by the specific heat and temperature rise (280°). For the specific heat values Figure 2 is shown. The losses follow:

$$\begin{aligned} \text{CO}_2 &= 0.494 \times 280 \times .0243 = 3.36 \text{ B.t.u.} \\ \text{N}_2 &= 3.751 \times 280 \times .01856 = 19.45 \text{ B.t.u.} \\ \text{Air} &= 1.705 \times 280 \times .01845 = 8.81 \text{ B.t.u.} \end{aligned}$$

31.62 B.t.u.

Having covered the dry gases let us now consider the comparative methods of figuring water vapor losses.

1. The most usual method assumes that water is in the gaseous state over the whole temperature range, and the latent heat value is taken at the boiling point. The heat losses would then be computed as follows:

$$\begin{aligned} \text{Sensible heat} & 1.178 \times .0236 \times 280 = 7.78 \text{ B.t.u.} \\ \text{Latent heat} & 1.178 \times .04758 \times 971.7 = 54.46 \\ \text{Total} & 62.24 \end{aligned}$$

2. Water is assumed to be vapor above

212° and liquid between this and room temperature.

$$\begin{aligned} \text{Sensible heat vapor} & 1.178 \times .0234 \times 138 = 3.80 \text{ B.t.u.} \\ \text{Sensible heat, liquid} & 1.178 \times .04758 \times 142 = 7.60 \\ \text{Latent heat} & 1.178 \times .04758 \times 971.7 = 54.46 \\ \text{Total} & 65.86 \end{aligned}$$

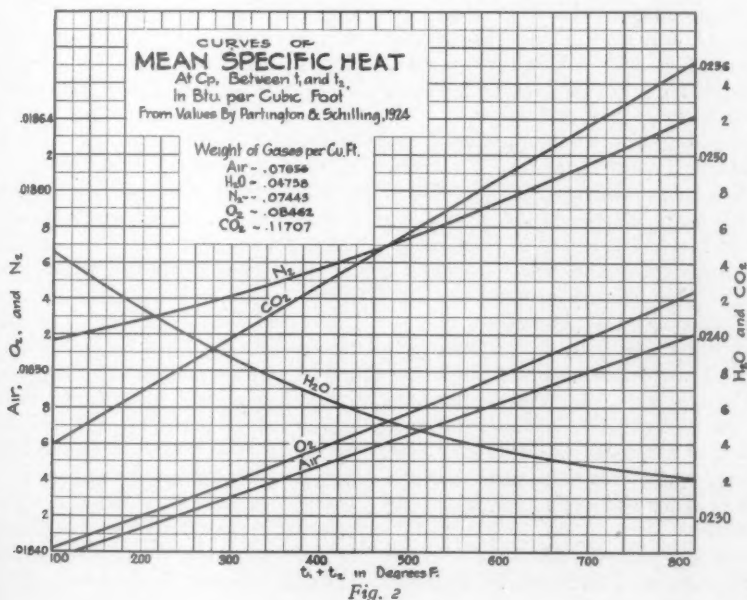
3. Water is considered as liquid below the dew point, and as vapor above. The dew point is determined by the law of partial pressures: vapor tension = 760

$$\times \frac{1.178}{4.245 + 1.705 + 1.178} = 126.5 \text{ mm.}$$

Hg. corresponding to a dew point of 134° F.

$$\begin{aligned} \text{Latent heat at } 134^\circ & = 1017.8 \\ \text{Sensible heat, vapor} & 1.178 \times .0235 \times 216 = 5.98 \text{ B.t.u.} \\ \text{Sensible heat, liquid} & 1.178 \times .04758 \times 64 = 3.59 \\ \text{Latent heat} & 1.178 \times .04758 \times 1017.8 = 57.05 \\ \text{Total} & 66.62 \end{aligned}$$

(Continued on page 601)



The Laboratory is the Acme of Public Service

By CARL SHULER

Director of Law, City of Cleveland, Ohio

I WAS astounded when I saw the proportions of this building. I did not such a beautiful building for this particular purpose.

Cleveland is delighted and is complimented upon the fact that you have erected this institution here. I think Cleveland is a fitting place to have it, because Cleveland is the largest city which consumes natural gas, and is the city which consumes the most natural gas. Beside that, there are many other reasons why Cleveland is a fitting place for this laboratory to be located.

I think you will all agree that Mr. Gallagher and his committee and your Executive Board have made possible the erection of a very beautiful building—one that the city can be proud of. I think you will further agree with me that they did not waste money in unnecessary ostentatious display, but on the other hand they did not allow money to stand in the way of creating a very efficient institution. Cleveland recognizes its debt to all of you for bringing this institution here.

I am only telling the truth when I say that Mr. Gallagher is one of our finest and most representative types of citizens.

It is not my purpose to give you a lecture. It is a characteristic of your industry to do things quickly and efficiently. I do not propose to infringe upon that custom by making a long speech.

May I say, however, that I have been interested as a citizen in public utilities for a great many years. My first contact with them was in legislative halls. Ever since I have been interested in utility problems, and always have been as a citizen and as a lawyer, and for some few years as a public official.

But I feel you will all agree with me that the utilities of today are far different

from the utilities of twenty or more years ago. At that time the object of the owners of utilities seemed to be how much they could get from the public and how little they could give in return. We are all familiar with stock-watering lobbies in the legislative halls against any kind of measures which they thought might interfere with their financial returns, and other propositions of similar nature.

But now the utilities have taken an entirely different view of the situation and wisely so. The utilities today are attempting, and they are working with their patrons or customers and trying to give them a better service, a larger service and at a cheaper price. I think they are doing so both from a selfish motive and perhaps from a change of heart. But whichever attitude they take, even though it may be a selfish attitude, it is a wise move.

This laboratory is indicative of that spirit in the gas industry. From what Mr. Gallagher and others have said, it shows perfectly well that you are working toward the idea of giving your patrons a better product, to help them get a better instrument through which to use that product and to teach them how to use that product and get the most out of the money they pay for it. In other words, you realize that cooperation in your organization means efficient organization. But you now realize that cooperation should not stop there, but should continue on through to the patron—the ultimate consumer.

I think I am only stating the truth when I say that since I have known Mr. Gallagher, which is twelve or fifteen years—even before I became a public official—he has always stressed the proposition of trying to serve the patron as being a wise business move. That has been his attitude in Cleveland and I am quite certain he has accomplished his purpose.

Laboratory Issues Three Important Bulletins

Titled: "Flow of Gas Through Orifices on Domestic Appliances," "Investigation of Gas Savers and Attachable Solid Tops," and "A Comparison of Gas and Electric Ranges for Domestic Cooking"

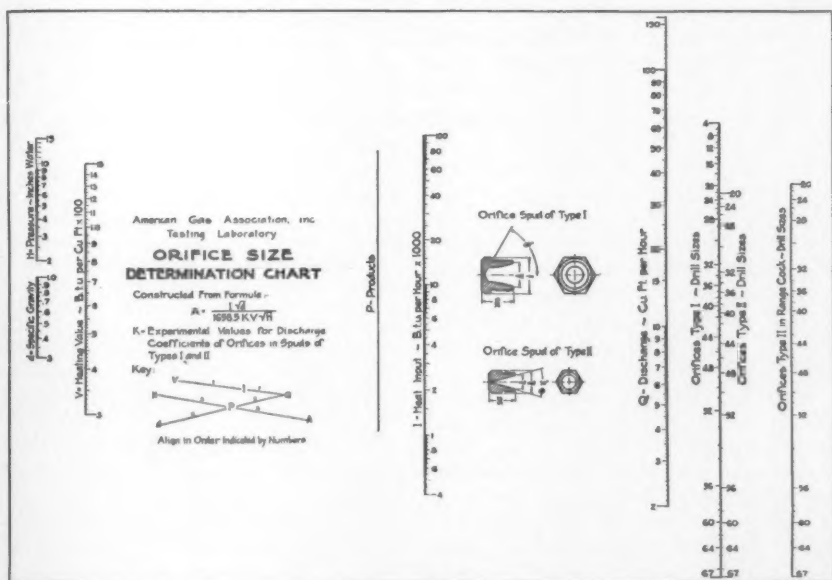
THREE bulletins which are of more than usual interest to both gas companies and gas appliance manufacturers have recently been published by the American Gas Association Testing Laboratory. These bulletins are the first of what may be a number of papers on subjects dealing with special problems of the gas industry. Each of the present bulletins comes as a result of original research and contains much material which many will find desirable to have available for ready reference.

"Flow of Gas Through Orifices on Domestic Appliances," by Otto Lutherer, testing engineer, and J. Donald Kroeker, publications editor, is the name of Bulletin No. 1. Rather than attempt to make generalizations, the Laboratory selected several representative orifice spuds for

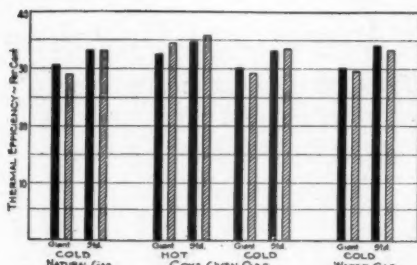
the investigation covered by this 28-page booklet. Discharge coefficients were obtained for orifices of sizes varying from No. 70 to No. 20, standard twist drill, in spuds having an angle of approach of 60 deg. and 15 deg.

The authors found that the coefficients of discharge varied from 0.79 to 0.833 in the case of orifices in spuds having an angle of approach of 15 deg. and that they varied but slightly from 0.80 in the case of the other.

In order to facilitate the calculations necessary to determine orifice sizes, the authors have included tables that offer a ready short-cut. To obviate the necessity of making any calculation whatever, a nomographic chart, by means of which it is a very simple matter to determine



The orifice size determination chart



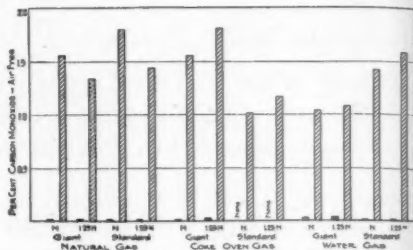
Effect of "gas savers" on efficiency. Solid columns indicate efficiency without "savers." Shaded columns indicate average efficiency obtained when "savers" are used

orifice sizes in spuds of the types investigated, is also included.

A table giving the heating value, specific gravity, and pressure of the domestic fuel gases supplied in those cities of the United States and its territories and of the Dominion of Canada which have a population of 25,000 or more, which is made a part of this booklet, is a very helpful compilation for the manufacturer who equips his appliances with fixed orifices. This table is compiled, except in a few cases which are indicated, from answers to a questionnaire originated by the Testing Laboratory.

Bulletin No. 2, entitled, "Investigation of Gas Savers and Attachable Solid Tops," by J. W. Farren and F. A. Allen, testing engineers, and J. Donald Kroeker, publications editor, is a report on an investigation made to determine the safety of various gas appliance attachments which, according to claims made by manufacturers of these devices, are supposed to increase the efficiency of gas range top burners to which they are attached. The paper is in two parts, Part I covering the tests on "gas savers," and Part II, those on attachable solid tops.

Tests for efficiency and completeness of combustion were made on nine "gas savers" comprising types manufactured of cast iron, soapstone, pressed asbestos, and sheet metal. The authors found that the average efficiency of a top burner is slightly less when these devices are used, there being a slight increase in only a few cases. The effect of these devices on



Effect of "gas savers" on completeness of combustion. Solid columns show CO produced without "savers" and shaded columns show average concentration produced by these devices. "N" means normal pressure

completeness of combustion was such, however, that, the authors conclude, the sale of them should be prohibited. Indeed, a brief study of the data obtained, which is presented in the form of tables and curves, shows the great hazard presented by the usual "gas saver."

The claims made for the attachable solid top by its manufacturers and salesmen are set forth and each one briefly discussed. To show that these devices are also a distinct hazard, because they promote incompleteness of combustion, a series of tests was made. The data show that invariably a dangerous condition results from replacing the grid of an open top range with a solid top that is not especially designed for it. The conclusions of the authors are set forth as follows:

"No solid top should be used on any range other than one which is especially designed to accommodate it and which embodies the principles of good solid top design. Any attachable top on a range not designed for its use is likely to cause the production of dangerous quantities of carbon monoxide. While it is possible to make an attachable solid top that may be used with safety on a few ranges, the probability of its operating satisfactorily on hundreds of others is so extremely remote that its use should not be seriously considered."

"A Comparison of Gas and Electric Ranges for Domestic Cooking," by George B. Shawn, Laboratory Supervisor, and Russell W. Heywood, testing engineer, is the name of Laboratory Bulletin No. 3. A very complete and impartial comparison, this paper is based

largely on an investigation at the Testing Laboratory, although much material has been taken from other sources, notably reports of schools of home economics. Several tables included show the results of tests for cooking speeds, efficiency, and continued cooking on top burners and electric units, and for energy required to heat ovens of ranges of both types to and maintain them at certain temperatures.

The conclusions of the authors are summed up as follows:

1. Either gas or electric ranges may be secured in a sufficient variety of models to meet ordinary needs. Where space is limited, gas ranges afford more range of choice.

2. The initial cost of the electric range is approximately twice as much as the usual gas range, and, on account of the construction of its heating elements, its upkeep costs will be higher. Further, the installation costs are more for the electric range.

3. Both ranges are convenient in use, the electric range being more easily cleaned, and, through its insulation, tending to allow lower temperatures in the kitchen during hot weather. Insulated ovens may be obtained on gas ranges although comparatively few are now in use.

4. The gas range is much faster in operation than the electric, particularly for cooking top work. This result is a great saving of time to the housewife, which, in view of changing living conditions, is daily becoming a more important consideration.

5. Electric ranges have greater thermal efficiency than gas, requiring on an average about one-half as much energy to do the same work. This is, however, more than offset by the higher price of electricity. In general, electric range cooking will probably cost twice as much as with gas. The efficiency of the electric range

apparently decreases with use, and varies with the size of the vessel.

6. Little difference can be found in the effects on food cooked by either type of range.

7. While each range has some advantage over the other, the lower first cost, upkeep, and installation costs of the gas range, with its lower operating cost and advantage in cooking speed, will probably always prove most practical for use in the average American home.

All of the above mentioned publications are now ready for distribution. One copy has been supplied to each member company, and information on securing additional ones may be obtained by communicating with the Testing Laboratory.

Computation of Flue Losses

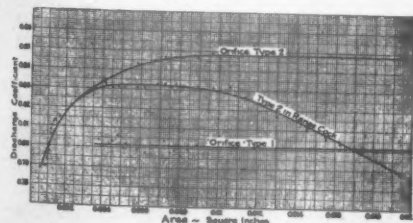
(Continued from page 597)

4. Water is considered as vapor above room temperature, condensation occurring at room temperature. Latent heat at 70° = 1052.8.

		B.t.u.
Sensible heat	$1.178 \times .0236 \times 280 = 7.78$	
Latent heat	$1.178 \times .04758 \times 1052.8 = 59.01$	
Total		66.79

Of the four methods the third most nearly approximates the true conditions. The use of the fourth, however, will cause little error and has the advantage of less computation. The use of the first method, where condensation is supposed to occur at the boiling point, is obviously in error, the error in this case being 4.38 B.t.u. or 6.6 per cent of the total loss due to water vapor. This error is equivalent to 13.8 per cent of the loss due to dry combustion products. Obviously, if losses other than those due to non condensation of water vapor are to be considered, the selection of the correct method for computing water vapor losses is very important.

AT the meeting of the A.G.A. Committee on Industrial Gas Research held in Chicago, September 12, H. Stued, president of the American Bakers Association, presented an informal talk on the manner in which the gas research is now being conducted at the American Institute of Baking.



Discharge coefficients of orifices in spuds of Type 1, of type 2, and of type 2 in standard gas range cock

The Significance of the Coal Conference

An Interview of the Editor with

Dr. THOMAS S. BAKER

President, Carnegie Institute of Technology and Chairman of the
Second International Coal Conference



Dr. Baker

THERE is little doubt that the Second International Coal Conference, to be held at Carnegie Institute of Technology, Pittsburgh, Pa., from November 19 to 24, will be of vital interest to the gas industry.

Dr. Thomas S. Baker, president of the Institute and chairman of the committee in charge, is keenly interested in the progress and development of the gas industry, and kindly consented to an interview to present his ideas of the conference to the 7,000 readers of the A.G.A. MONTHLY.

Since the conference is to be a symposium on the coal industry of the world, it is of course of value to all industries which utilize this basic resource. That the gas industry is vitally concerned is readily apparent.

Dr. Baker is a keen student of modern industry. As president of one of the important institutions of learning, he occupies a responsible place in American life. His views on the conference and his opinions on the gas industry are therefore of inestimable value. While Dr. Baker talked mainly of the conference and its significance in this interview, he also expressed definite opinions on the gas industry and "the great future that gas, the ideal fuel, will play in the industrial and domestic life of the citizens of the world."

"This conference is of prime importance to the gas industry because it will be concerned with the material from which gas is made," Dr. Baker said. "In my contact with gas men, both here and in Europe, I have unearthed a spirit

which is essentially one of keeping ahead of the times.

"I feel reasonably sure that gas is the ideal fuel, and here in America it is almost certain that tomorrow's gas industry will eclipse today's, just as today's is larger and plays a much more important part than yesterday's."

The coal conference will be of interest to the gas man for four reasons, in Dr. Baker's opinion.

"First, of course, there are the papers dealing with gas subjects," he said. "Those in charge of the program have been able to secure speakers of international fame to address the sessions on certain phases of the gas industry which are of present-day importance to the entire industry.

"A listing of a few of the subjects to be presented will prove to the members of the American Gas Association that this conference will strike at certain basic problems which are as important as they are timely.

A FEW FACTS ABOUT DR. BAKER

DR. THOMAS S. BAKER, president of Carnegie Institute of Technology, and chairman of the Second International Fuel Conference, was born in Aberdeen, Md., in 1871. He has A. B. and Ph. D. degrees from Johns Hopkins, a Ph. D. from the University of Leipzig, an LL. D. from the University of Delaware, and a Sc. D. from Duquesne University.

He has been president of Carnegie Institute since 1922, and he was secretary of the Institute from 1919 to 1922.

Dr. Baker has also been a professor of modern languages, and was music critic of the Baltimore Sun from 1895 to 1905. He is the author of a book, and has contributed literary and educational essays to magazines and newspapers. He was a lecturer at the Carnegie Endowment for International Peace, in Paris, in March, 1928.

"Among these subjects are low temperature distillation, high temperature distillation, coal tar products, complete gasification of coal, hydrogenation, etc. The speakers who will present talks on these subjects are international figures. From England we will have Dr. Cecil H. Lander, director of fuel research, Department of Scientific and Industrial Research; Lord Melchett; Dr. E. W. Smith, technical director, The Woodall-Duckham Companies, and others.

"A conference such as this truly deserves the name 'International.' France will be represented by Jean Bing, Comité Central des Producteurs et Distillateurs de Goudron en France; A. Mailhe, professor, Etude des Combustibles, Faculté des Sciences à la Sorbonne (probably the greatest living French Chemist and occupant of a chair at the Sorbonne paid by the gas industry); C. Simon, l'Administrateur Delegee Société pour l'Exposition des Tubes Electro-Frettés, who will talk on propelling motor vehicles with gas; and several other Frenchmen prominent in gas circles.

"Germany will send Prof. Doctor Franz Fischer, Kaiser Wilhelm Institut für Kohlenforschung, to talk on gas purification, and Dr. Alfred Pott, A. G. für Kohlenverwertung, to address the sessions on piping gas from the by-product coke ovens of the Ruhr to Berlin, a subject which will be of the greatest interest to the gas industry of America.

"Dr. J. E. Noeggerath will also come from Germany to describe a process of dissociating hydrogen from oxygen in water, and Prof. Ernest Terres, Technische Hochschule, Braunschweig, will have coking for his subject."

Leaders from Italy, Austria, Belgium, Czecho-Slovakia, Denmark, Japan, Norway, Poland, Russia, and Spain will also be present.

Among the American engineers and scientists known to the gas industry who will present papers are: Professor Harry A. Curtis, Yale University; Prof. Hugh Taylor, Princeton University; Christie



H. B. Rust, left, and Alphonse Mailhe, right. Mr. Rust is on committee in charge of coal conference, and M. Mailhe will deliver an address at the sessions

Jacobus, president, Continental Industrial Engineers; A. C. Fieldner, U. S. Bureau of Mines; Prof. Wilbert J. Huff, School of Engineering, Johns Hopkins University; Dr. Arthur D. Little, consulting engineer, Boston; Dr. H. C. Parmelee, editor, "Chemical and Metallurgical Engineering;" Prof. S. W. Parr, University of Illinois, president of the American Chemical Society; Dr. F. W. Sperr, Koppers Company, Pittsburgh, Mellon Institute; Dr. R. Thiessen, Bureau of Mines, Pittsburgh; F. R. Wadleigh, consulting engineer, New York; Prof. Alfred H. White, University of Michigan; D. W. Wilson, vice-president, Dry Quenching Equipment Corporation.

"In addition to the actual addresses on gas, there are three other reasons why the gas man is interested in the Coal Conference," Dr. Baker continued.

"The wide-awake executive and engineer of today keeps abreast of the times, and this conference will be the opportunity for all concerned to keep up with coal developments. There are the added advantages of hearing papers on subjects closely allied to the gas industry, and the contacts, both national and international, which can only be made at such a gathering as this."

LOW-TEMPERATURE DISTILLATION

In answering a question on low-temperature distillation, Dr. Baker said:

"Low-temperature distillation is what

the wily politician once said of the tariff —'it's a local question.'

"Low-temperature men, of course, are not unanimous in stating the results they are after. The subject is being watched carefully by the leading gas engineers, however, and, if in the future, we find that it is the solution to certain of our problems, I am sure the gas industry will not be behind the times. It is reasonable to think that low-temperature distillation may solve certain perplexing problems of individual plants, and the industry should have an open mind concerning the possibilities of this new process.

"I cannot emphasize too strongly the need for proper attention to the economic aspects of the low-temperature problem. This, as other problems, must go through four separate stages. First, we have the laboratory stage, then the experimental

plant, then the large plant, and finally the group of large plants. If the United States fails to pay sufficient attention to the low-temperature distillation of coal, I feel that it will be a gross error, despite the seeming over-abundance of oil at the present time.

"The problem of what can be done with low-temperature tar has not been solved, and here again we may see a development of great interest to our gas companies.

"At the conference we hope to bring out the details and various ramifications of all present-day problems. The 'complementary presentation' of addresses and the discussions will certainly be of great assistance in unearthing every bit of information there is available.

"There will be other addresses of interest, and some will be on subjects with

(Continued on page 615)

New York Will Have Second All-Gas Apartment



All-gas apartment house now being built in Bayside, L. I., for 14 families. It is insulated, and gas service will be used exclusively.

ENTHUSIASTIC over the success of their first all-gas apartment house, completed several months ago, the Dentson Realty Corporation, of Bayside, L. I., are now erecting a second, for fourteen families, in the same community.

In addition to its all-gas features, the new building will be insulated to hold in the warmth during the winter and keep out heat in the summertime. It is believed to be the first insulated apartment house in the East.

As in other all-gas homes, tenants will enjoy a constant, even temperature, automatically controlled, throughout the winter. They will have the use of indoor gas laundry dryers, and will be assured of twenty-four-hour hot water service by means of modern gas water heaters. All garbage and rubbish will be consumed in gas



incinerators, while each apartment will be equipped with the latest combination gas range and gas refrigerator.

As a direct result of these conveniences, which are designed to do away with virtually all disagreeable household tasks, both the tenants and neighbors of this ultra-modern new apartment house will be spared the periodical invasion of the coal wagon and the daily rattle of the garbage cans. The need for janitor service is done away with entirely.

First Manufacturers' Section Conference Outstanding Success

By A. G. A. STAFF MEMBER

THE first Conference of the Manufacturers' Section of the Association was held at the new A. G. A. Testing Laboratory building in Cleveland, Ohio, on September 14, with H. Leigh Whitelaw, chairman of the Section, presiding.

More than 100 manufacturers were present and heard addresses and discussions on subjects of great importance to the manufacturers of the industry. In addressing the meeting Mr. Whitelaw said that the purpose of the conference was to provide the necessary channels by which it would be possible to utilize the mass thought of the 600 manufacturer members. He paid tribute to the splendid Laboratory building which had been dedicated the day before, and said that the Section was indeed pleased to be the first to hold an official meeting in the new building.

Oscar H. Fogg, President of the American Gas Association, delivered a stirring address in which he made constructive suggestions to the Section. Col. Fogg's address is presented in full elsewhere in this issue.

Alexander Forward, managing director of the A. G. A., took for the subject of his address the salesmen's training course which is to be started shortly by the Commercial Section. Major Forward explained the survey which had been made of the entire industry, and he said he had found therein interesting, significant, and humorous facts, much out of the ordinary run of information.

Regarding the preferences of gas company executives on the educational qualifications of salesmen, Major Forward said:

"In reading the survey I was struck with the marked and even radical differences of opinion on this subject expressed by men of equal experience, success in their work and weight in the industry. Some of them say with emphasis

that their salesmen must have technical training and often that they should have come from the shops of their own or some other company. It is necessary, say some of these managers, that domestic salesmen should be familiar with flame temperature, radiation, convection, and allied subjects. Others are just as positive that technical training is a hindrance to a salesman's success and usefulness. Some of these say that the technically trained man is likely to talk to the average domestic consumer in technical language and serve to confuse rather than clarify the situation. Others say that the salesmen should know only enough on this score to explain what the appliance will do and the approximate amount of gas it will consume. My check indicated that approximately for each executive who favors technical training for salesmen there are two who are opposed to it and I was interested to observe from the Business Training Corporation's report to our committee that the actual ratio is 67 per cent to 33 per cent. I repeat that, although outnumbered two to one, the advocates of technicians as salesmen are just as good and just as successful executives as those who take the opposite view."

Major Forward also commented on the absolute unanimity of opinion that the salesmen's training course is badly needed by the industry. He said further:

"It is quite noticeable that a large percentage of executives interviewed believe that at this particular juncture the best opportunity for large increases in the domestic load lie in water heating. This is because in most instances the customers are already well supplied with ranges and it is not because the executives generally depreciate the importance of load building through other appliances but rather that water heaters will consume more of our product than other domestic appliances which are as readily saleable.

"The sales manager of a large holding company expresses himself as follows:

"A year after I came we sold 85 heaters. At the close of that year I had a pretty good program outlined and I wrote the ——— heater people and asked them what price they could give me on 1500 heaters the next year. They laughed at me but gave me the price when I insisted that they must deliver 1500. We sold 1640 heaters that year. Last year we sold

something above 1900 and we haven't even scratched the surface so far as possibilities are concerned. Our present quota rate for our sales organization is one heater to every 40 meters in each territory so you can see what possibilities we have left. We have made little or no profit off of these heater sales. Our appliances are sold only to build up our load. Last year I got figures on 241 families to whom we had sold water heaters that year. The average rate of gas consumption for the year before the heaters were installed, for these 241 families, was approximately 28,000 cu.ft.; the year after the heaters were installed, the average consumption for these 241 families was approximately 41,000 cu.ft., or an average increase of 11,000 cu.ft. per year—practically 40 per cent increase. Extend that to the same 3,000 homes to which we have sold burners in the past three years, and you get some impression of the value of this heater campaign."

Major Forward said that approximately two-thirds of the salesmen referred to the Laboratory's seal of approval on the sales floor and in the homes of customers. In no case did the survey disclose serious misapprehensions as to the purpose of the seal. He also declared that most companies see a tremendous field for the gas industry in house heating and expressed the outmost confidence in the method of the future.

In concluding Major Forward pointed out the following as outstanding results of the survey:

"1. There is plenty of constructive thought, plenty of determination and constancy of purpose, plenty of genuine leadership and a surprising amount of enthusiasm in the gas industry.

"2. There are striking differences of opinion as to methods and sales policies in many instances. I repeat that these differences exist between men of equal capacity and equal standing. They only serve to show that we have originality of thought and individuality of execution.

"3. Notwithstanding this individuality, the executives almost without exception welcome the advent of the Training Course in the belief that it will result in better trained salesmen, more business and a reduction in their own expense for salesmen's training.

"4. I believe it was Carlyle who said that 'genius is an infinite capacity for taking pains.' A review of this latest and most comprehensive information on the industry's marketing leads

me to define salesmanship as common sense consistently and persistently applied."

The next subject to be taken up was advertising. F. A. Lemke, of the Humphrey Co., reported for the Association's Committee on National Advertising and said that national advertising effort will be deferred until success is more sure than at present, and that the Committee will take up consideration of the regional advertising plan. He said that the committee feels that national advertising at this time does not have sufficient membership sentiment.

Alexander Macomber, Charlestown Gas & Electric Co., Charlestown, Mass., presented the gas company side of the New England plan of regional advertising, and Merle Abbott, Glenwood Range Co., presented the manufacturers' side.

In this symposium of the New England Plan a great deal of pertinent and valuable information was brought out. Mr. Macomber went into much detail concerning the organization, and also discussed what he called the simple financial scheme which was developed. This was an assessment of 12¾ cents per meter, and 80 per cent of the meters in New England contributed. Manufacturers are assessed for one per cent of their net sales to gas companies which are contributing to the program.

Mr. Macomber said the objects of the plan are: 1. To create gas consciousness; 2. to merchandise gas. He said that it was true that some executives wanted the second idea stressed rather than the first. The program is specifically merchandising, and not good will.

The program at the present day covers 99 cities and 67 gas companies. Advertising appears on the average of twice a week in 132 newspapers with a total circulation of 3,450,000. Twenty-nine of the newspapers are foreign language.

The percentage of the advertisements devoted to different services rendered by gas is as follows:

Cooking	18%
Water Heating	30%



Manufacturers' conference luncheon held in Testing Laboratory

Refrigeration	12%
House Heating	8%
Garage Heating	14%
Incinerator and Laundry	9%
All Gas House	3%
Miscellaneous	6%

Local tie-up of displays, reprints for mailing, stickers, etc., are part of the plan.

Mr. Macomber also said that the committee had made a mistake in selling the plan for only one year instead of three.

Mr. Abbott, in presenting the manufacturers' side of the regional advertising question, carefully defined the purposes of cooperative advertising as against those of other advertising. He said that cooperative advertising is used to recapture new and old markets, since the service which gas renders is of a primary purpose, and every gas company is competing for some share of the customer's dollar. Local advertising cannot do what cooperative advertising can because local advertising usually has no continuity and does not cover territory consistently.

Mr. Abbott said that next year the New England program will probably be conducted the same as it is, with the possible addition of a radio program and more direct mail tie-ups. He said that the plan was a definite good to manufacturers because of the following: Will build business faster than by own effort; will enhance market; will increase quality standards; will improve buying standards of companies and public; opens allied markets; brings better production methods; increases quality of product, and stabilizes buyers' standards.

He said that 32 or 33 manufacturers are contributing to the program.

In the discussion which followed this presentation it was brought out that the manufacturers contributing thought their investment a good one.

Mr. Lemke then presented his views of national advertising. He said that the New England plan is at best a stop-gap pending development of a practical national advertising program. He said that the industry needs national advertising and in his opinion the time is ripe for it.

In a special symposium on research cooperation, Walter C. Beckjord, chairman of the Technical Section of the A. G. A., and vice-president and engineer of the American Light & Traction Co., stated that in the gas industry research is especially fundamental. He mentioned and commented briefly upon the definite programs now being conducted by the American Gas Association, and added that the mixed gas research is especially vital as on the results secured from it depends the design of future plants.

He suggested that the automobile industry be considered in regard to its relation to the gas industry. The automobile industry not only consumes a large amount of gas, but it has also changed the living habits of practically all the domestic customers of the gas companies, he stated.

Mr. Beckjord quoted the following advertisement of the General Motors Corporation as a definition of the proper place of research.

"Equipped with the largest research laboratories and proving ground, and guided by an open mind which is ready to revise its thinking in response to new facts, General Motors believes that it is peculiarly fitted not only to sense but to anticipate public demand and to give the people better automobiles at better values year after year."

He also said that a discussion of the future of gas brings up the future of electricity. There should be no competition now between the two industries, and it is evident that they must work together, he said. In the electric industry research is borne almost entirely by the sale of lamps, while in the gas industry a great deal of research must be done by the various gas companies as well as cooperatively.

Mr. Beckjord also mentioned the dehydration plant which has been erected in Grand Rapids, and he commented on the competition of butane and propane. He said:

"The research question is not altogether a technical one. It is a search for facts and how to utilize these facts. Research will lead almost anywhere, but we are fundamentally interested in the commercial success of our industry and that success is measured in dollars.

"There is a definite trend to lower B.t.u. standards, and this merits our close consideration if we are to arrive at the complete carbonization of coal."

One of the greatest advances of research work in Mr. Beckjord's opinion is the new Laboratory building. He said that the work conducted there is not hampered by tradition or preconceived ideas.

Regarding the sale of off-peak gas and necessary research on this subject, he declared that this is not alone a technical problem as all departments of the gas company are involved and must cooperate to sell gas in large quantities. In selling gas in large quantities it is necessary that it be sold at a low margin of profit.

Regarding the low rate of capital turnover in the gas industry, which at present is five years, Mr. Beckjord said that the lower cost of high-pressure distribution will help to remedy the problem. He also suggested outdoor construction as another remedy.

In closing, Mr. Beckjord said:

"Any industry which faces its problems with an open mind will go ahead. Today it is absolutely necessary for industries to keep abreast of the times and be willing to make constructive changes at all times with an open mind based on facts developed in research. We must get the facts and if we plan our future developments on that basis, our industry will continue to maintain its prominent place in the front rank."

Henry O. Loebell, vice-president, Combustion Utilities Corp., next presented an address entitled "Cooperative Research as it Affects the Field of Industrial Gas Utilization."

He commented briefly upon the possible pooling of patents in the gas industry and gave the conclusion that in the gas industry this action would not be of material assistance. He described the American Gas Association policy with regard to research by saying that where research is being conducted by a commercial organization the patent rights belong to that organization.

A. E. Stacey, vice-president in charge of research, Carrier Engineering Corp., also contributed to this symposium on research cooperation and said that gas is destined to be the future fuel. He said:

"As you possibly know, I believe that gas is destined to be the future domestic fuel in cities, and I believe it is only through concerted research that development and improvements in the application of gas for domestic purposes can be attained. The possibilities for improvement in domestic gas appliances is very great. There is, for example, a possibility that the home can be heated with gas, not only economically as compared with the present method of utilizing coal, but with a service in maintaining and regulating temperature, cleanliness, and atmospheric control which has heretofore never been thought possible. Not only can the house be heated and conditioned economically and perfectly in winter, but gas can be utilized to operate refrigerating equipment which will cool and remove the moisture from the air in summer. It is evident that these at present unknown developments can be accomplished only through research.

"Research may be considered divided into two general classifications. The first is that type of research which relates to fundamental phenomena or basic relationships. By this, I do not mean research in pure science, although it is analogous to it. The second classifica-

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The Value of Manufacturers' Organization

The Benefits of the Action by the Manufacturers' Section to Unite into a More Important Unit

By OSCAR H. FOGG

President, American Gas Association, Vice-president, Consolidated Gas Co., of New York



O. H. Fogg

I BELIEVE that I voice the sentiment of all of the Association's interests when I say that the industry as a whole heartily welcomes evidence of the intention of the manufacturers to organize as a more cohesive and constructive unit, and as such, to play a more prominent part in the Association's affairs.

Of course it is saying nothing new to tell you that the gas industry recognizes, as the years have passed, that the status of the manufacturers has become an increasingly important one, but thoughtful men within your field, as well as outside its borders, have believed that an even greater importance and greater progress would follow the closer organization of your interests.

It has been suggested that in so organizing, the manufacturers will establish for themselves a more specific identity in the work of the Association. That will inevitably follow, but to my mind that is only a part of what may be hoped for. I believe that what is motivating the manufacturers in general is recognition of the necessity for a broader consideration of those fundamental economics which are affecting their business. If that is so, they are taking the wise course in preparing to deal with their problems as a group, instead of as individuals.

It is a perfectly logical procedure and one that industry frequently resorts to, when a group of manufacturers is faced by economic problems, to turn to some

unprejudiced body for assistance in their solution. The American Gas Association does not seek to assume the role of a dictator and point out the path which any of its constituent branches should follow, but representing the constructive forces of the industry as a whole, it would be remiss if it did not stand ready at all times to welcome any opportunity to aid in the solution of whatever problems may beset any or all groups of our member interests. Indeed, that is one of its principal reasons for being.

Now, I do not profess any intimate or direct knowledge of the economic status of our manufacturing interests today, and I have nothing more definite to guide me in my remarks, than impressions. You will know better than I whether they rest upon a solid foundation or otherwise. They are chiefly the result of discussions with men in your branch of the industry who, I believe, are giving thoughtful consideration to certain trends in our business.

In every branch of our industry's expansion, competition must be faced. In the promotion of the utility company's business it is ever present. Today it is more than ever the predominating note of all commercial and industrial enterprise. So it is perhaps only natural that we should hear it so frequently mentioned in its relation to the manufacturers of gas appliances, particularly of the domestic type.

In so far as competition may be the outgrowth of conditions arising solely within your own industry, I suppose one point of view would be that it is your own problem and your own affair—and not a proper field for Association action or concern—beyond the activities of your own Section.

Presented at the first Conference of the Manufacturers' Section, Cleveland, Ohio, Sept. 14.

But let us consider that point of view. You are an integral part of the Association; you are a vital part of the industry itself. Whatever affects you, for good or for ill, has its corresponding influence upon the welfare of the whole industry—a fact much more generally recognized today than it was a few years ago. So it does not require any very elaborate process of deduction, to conclude that a prosperous and progressive manufacturing industry is much to the advantage and benefit of the gas industry. I believe it is essential to its welfare—for only out of such prosperity can come the research, the development, improvement—in short, the progress without which our expansion in the domestic field would halt and ultimately die.

And so, because the prosperity of the manufacturer has a definite relation to the welfare of the industry, we should be and we *are* concerned with any conditions that threaten his prosperity, or tend to reduce his earnings below the reasonable profit to which all well-conducted business enterprises are entitled.

I am encouraged in the belief that there has come about a more general and a much more practical recognition of this fundamental principle by the utility purchasers of gas appliances, and that recent years have witnessed a decided broadening of view. It is true that there are still gas company buyers whose vision goes no further than the price tag (I've met some of them myself in my brief career as a manufacturer) but on the other hand there are some manufacturers who cater to and encourage that weakness. I'll be very glad when both have passed on, for neither is helping the gas business.

But more within your own ranks, if I am correctly informed, there appears to be another and far more important condition that is influencing the economic status of your business, and if I may presume to speak in my personal capacity, I will say frankly that I regard it as a distinct menace.

Manufacturers appear to have entered, and I am told, continue to enter the domestic appliance field with little or no knowledge of the true potentialities of the market and in the face of the fact that the annual capacity of existing appliance manufacturing establishments is said to be conservatively reckoned as adequate to meet the new and replacement requirements of the next ten years, computed at the current rate of growth. You may or may not regard this as a conservative estimate. I personally have no means of developing the facts, for the appliance manufacturing industry, so far as I know, is still without statistics, and that I want to go into further in a moment.

But if the facts should reveal a picture even approaching the outline I have sketched, you and the industry have something to think about.

We do not need more appliance manufacturers—the field is already crowded. We do want well-organized, progressive manufacturers, capable of operating profitably and ready to put a reasonable part of their earnings into the development and improvement of their product.

The continued invasion of this established field can only mean production far in excess of that which the market can absorb, with its attendant fruitless competition, price slashing and loss, a condition that can be likened somewhat to that in which the bituminous coal mining industry found itself—with the nation's total demand divided among so many producers that none could reap more than a meagre profit, and most of them none at all.

And so, with conditions such as these looming as possibilities, or others that may ultimately have immediate bearing upon your and the industry's welfare, your action to bring about a closer organization and unity of your own interests becomes one of especial interest. The problems confronting any group or body can not be solved by independent or individual effort, but only by the constructive and united effort of the group as a

whole, and the closer organization that you are taking steps to bring about should, and I believe will, function effectively on your behalf and to the advantage of the whole industry, following, as it will, the objects for which the Association was organized as set forth in its Constitution.

Earlier I referred to the fact that our manufacturing industry was without statistics. I recall the efforts made some years ago to assemble comprehensive statistics of your branch of the business. They were unsuccessful; possibly certain prejudices or lack of confidence stood in the way—yet many times such information could have been used to your advantage. It is in the language of comprehensive statistics that we can speak intelligently to the layman—to the publicity bureaus and others. Only recently I was asked by some financial interests for an opinion as to the wisdom of their financing a new appliance enterprise in an already established field. I had my opinion and gave it, but how much more convincing that opinion would have been had I been able to support it with facts.

Chambers of Commerce and Boards of Trade are constantly urging new industries to come to their localities. Concessions and inducements of various kinds are frequently offered, as we all know.

In an editorial in the American Gas Association MONTHLY for March, 1928, entitled "Economics Enters the Picture," Major Forward, the Association's managing director, pointed out that very often the field of production is so completely filled that new enterprises in such a field mean unnecessary risk of new and already established capital, and the creation of over-production in a manner that does the entire body of business no good and a great deal of harm.

He went on to say that there will ultimately be intelligent study of the set-up in every community, with appreciation of the relative position which our industry should occupy, and some understanding of correlation of production facilities in

RESEARCH
ADVERTISING
EDUCATION

SAFETY
RATE STUDIES
SALESMANSHIP

PUBLIC RELATIONS
INDUSTRIAL DEVELOPMENT
TECHNICAL PROGRAMS
STATISTICAL SERVICE

AMERICAN GAS ASSOCIATION

REAFFIRMATION

THE Annual Convention is the time to reaffirm our understanding of, and belief in, a united Gas Industry—its aims and standards, its function and its common worth.

With our thoughts fixed upon progress, we are ever seeking the best path to that end.

We can be proud of what the American Gas Association has done. We can all take part in its immediate accomplishments.

Since each year is the beginning, and not the end, of a new program, let us measure our participation in this meeting by the extent of our faith in the future.

CONSOLIDATED GAS COMPANY
of NEW YORK
GEO. B. CORTELYOU, President

1823—More Than 100 Years of Uninterrupted Public Service—1928

In this magazine advertisement the Consolidated Gas Co. of New York expresses its faith in the American Gas Association

accord with the needs of the hour, and he expressed an opinion in which I heartily concur—that under existing circumstances an individual who does anything toward the encouragement of new companies for the manufacture of domestic gas-burning appliances, and especially ranges, should be incarcerated in some institution, for, as he says, everyone knows that the field is tremendously overdeveloped already.

If this is true, why should we hesitate to say so; why should we not take the initiative in putting the facts before Chambers of Commerce, Boards of Trade, financial interests, and others.

One reason that we don't do so is because the facts have never been brought together. You have them, but they have not been assembled, and until trustworthy statistics of your business are prepared, our discussions will still have behind them no more convincing force than that

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TIDE OF MEN AND AFFAIRS



J. M. Bennett

and the Counties Gas & Electric Company.

Mr. Bennett is at present vice-chairman of the Publicity and Advertising Section of the American Gas Association.

B. H. GARDNER, who for the last four years has been assistant to the vice-president of the Northern Indiana Public Service Company, Hammond, Ind., has resigned in order to become director of sales and advertising of the Columbia Gas & Electric System.

Mr. Gardner has been in utility work for more than 22 years. He removed to Hammond in 1924 from Lafayette, Ind., where he was local manager for the Northern Indiana Company.

At the present time he is chairman of the Water Heating Committee of the Commercial Section of the A. G. A.

KARL NAGLER and **CLARENCE A. SCHNERR**, of The Peoples Gas Light & Coke Co., Chicago, Ill., sailed for Europe recently to attend the World Fuel Conference, being held in London, England, Sept. 24 to Oct. 6.

After the conference they will travel in Northern and Central Europe, visiting interesting gas developments.

LEON H. WARE is now manager of the Citizens Gas Co., of Salisbury and Delmar, Md., and of the Sussex Gas Co. and affiliated system, supplying four towns in Delaware.

Mr. Ware has had 24 years' experience in the gas industry, with manufactured and natural gas properties. For the past year he has been doing special work in Washington, D. C., as engineer for the Utilities Commission of the District of Columbia.

H. G. Hobbs, who has been manager of the Citizens and Sussex companies, is now manager of the Salem Gas Light Co., Salem, N. J.

JAMES M. BENNETT, manager of the department of public relations of the Philadelphia Electric Company, Philadelphia, Pa., has just been appointed manager of public relations for the Philadelphia Suburban Counties Gas & Electric Company. This subsidiary was formed last year out of the merger of the Philadelphia Suburban Gas & Electric Company

B. C. COBB, chairman of the board of directors of the Allied Power & Light Corporation and a vice-president of the Commonwealth Power Company since its formation, was named president of the Commonwealth organization at a meeting of the board of directors held Sept. 4. Mr. Cobb is succeeding George E. Hardy, who was elected to the newly created office of chairman. Mr. Cobb has held various positions in the management of public utility properties since 1895. He was connected with Hodenpyl, Hardy & Company, Inc., for 23 years, and when that company was consolidated last spring with the Stevens & Wood interests, to form the Allied Power & Light Corporation, he was serving as a vice-president of the company and as an operating official of many of its subsidiaries.

EARLE W. HODGES, director of public relations for Henry L. Doherty & Company, New York, N. Y., was elected second vice-president of the Lions International at the annual convention held recently at Des Moines, Iowa. Previous to the election Mr. Hodges was third vice-president.



F. C. Mackey

GEORGE MITTEN is now assistant to John G. Learned, vice-president in charge of sales, and Frederic C. Mackey has been appointed sales promotion manager of the Public Service Co. of Northern Illinois, Chicago, Ill. Mr. Mitten has attained considerable reputation as an authority on industrial development and sales engineering problems during his nine years of service with the Public Service Company. In 1925 he was appointed industrial development engineer and in 1927 sales promotion manager, which position he held prior to his present appointment.

Mr. Mackey joined the Public Service Company in 1921 as an industrial gas salesman. In 1925 he was made industrial gas engineer and in 1927 sales promotion assistant, the position he held prior to his present appointment. Mr. Mackey is well qualified for his new position having an excellent and diversified educational background, and many years of industrial management, engineering and sales experience. He is Chairman of the Industrial Gas Section of the American Gas Association.

Mr. Mackey joined the Public Service Company in 1921 as an industrial gas salesman. In 1925 he was made industrial gas engineer and in 1927 sales promotion assistant, the position he held prior to his present appointment. Mr. Mackey is well qualified for his new position having an excellent and diversified educational background, and many years of industrial management, engineering and sales experience. He is Chairman of the Industrial Gas Section of the American Gas Association.



W. E. Long



G. W. Curran



A. S. Corson



Johns Hopkins



Edward Porter

WALTER E. LONG, vice-president and controller of The Philadelphia Electric Co., Philadelphia, Pa., has been elected vice-president in charge of accounting of The United Gas Improvement Co. He succeeds George W. Curran, who resigned as vice-president and secretary. Johns Hopkins, assistant secretary of The U. G. I. Co., has been advanced to the post of secretary.

Edward Porter, general auditor of The U. G. I. Co., has been appointed controller of The Philadelphia Electric Co., and is succeeded in his former post by Albert S. Corson, who has been assistant general auditor. Mr. Porter also was appointed controller of the Philadelphia Suburban-Counties Gas & Electric Co.

In announcing the changes, Arthur W. Thompson, president of The U. G. I. Co., said, "Mr. Curran's retirement from the dual office does not deprive the company of his valuable services as he will continue his connection with the U. G. I. organization in a consulting capacity. Mr. Curran has been associated with the U. G. I. and subsidiary companies for 39 years."

Mr. Long, the new U. G. I. vice-president, entered the employ of Philadelphia Electric as a bookkeeper in 1904, and in 1916 he was made controller of the company. Ten years later he was elected vice-president. Mr. Long has resigned his posts with The Philadelphia Electric Co., and also has resigned as vice-president of the Philadelphia Suburban-Counties Gas and Electric Co.

Mr. Curran became associated with the U. G. I. as assistant general auditor in 1902. Previously he had been with U. G. I. subsidiary companies for 13 years, having started in the public utilities field with the Yonkers

(N. Y.) Gas Light Co., as a meter reader and collector in 1889. In 1912 he was elected secretary of the U. G. I. and in 1923 vice-president in charge of accounting.

Mr. Hopkins started his public utility career in the accounting department of the American Gas Co., 13 years ago. After being promoted to assistant treasurer and later assistant secretary, he was elected secretary of that company and subsidiary companies. On January 1, 1927, he became assistant secretary of The U. G. I. Co.

Mr. Porter, who has been with the U. G. I. for 34 years, started as a clerk in the accounting department. He was successively advanced to bookkeeper, accountant, assistant general auditor, and was appointed general auditor in 1919. He is at present chairman of the accounting section of the American Gas Association.

Mr. Corson entered the employ of The U. G. I. Co., as a bookkeeper and clerk, in 1906. Seven years later he was made a traveling auditor and in 1925 he was promoted to the post of special accountant. In 1927 he was made assistant general auditor.

P•MCDONALD BIDDISON has opened offices in the Bernhardt building, Monroe, La. Mr. Biddison is a consulting engineer in the natural gas and petroleum fields. He presented a valuable paper at the recent Dallas convention of the Natural Gas Dept. of the A. G. A.

THE Improved Equipment Co. of New York, and the Russell Engineering Co., of St. Louis, Mo., have been combined into the Improved Equipment-Russell Engineering Corp.

Henry L. Doherty is president of the company. Floyd G. Curfman, formerly vice-president and general manager of the Improved Equipment Co., is vice-president and general manager.

Other officers are:

Irwin Rawson, vice-president in charge of

sales, who was formerly vice-president and general manager of the Russell Engineering Co.

James M. Barber, secretary and treasurer, who held a similar position with the Improved Equipment Co.

Thomas B. Barclay, sales engineer, who was sales engineer of the Improved Equipment Co.

Glenn H. Niles, chief engineer, who was engineer of the Improved Equipment Co.

A. O. Schleiffarth, engineer in charge of construction, who was engineer of the Russell Engineering Co.

L. G. Grenshaw, Chicago district manager, who was assistant general manager of the Russell Engineering Co.

Charles F. Taylor, Chicago representative, who was representative of the Improved Equipment Co.



Miss Zillessen

ANNOUNCEMENT of the appointment of Clara H. Zillessen as advertising manager of Philadelphia Suburban-Counties Gas and Electric Company, Philadelphia, Pa., has been made by William H. Taylor, president. Miss Zillessen is the first woman in the industry to hold such a position and her appointment is the result of 14 years of

service. In 1914 she started advertising work for the Philadelphia Electric Company as a copy writer and in 1922 was made assistant advertising manager.

MEARS-KANE-OFELDT-INC., have announced the appointment of Herbert H. Etter as sales engineer for the Philadelphia district comprising Eastern Pennsylvania, Southern New Jersey, Delaware, Baltimore, and Washington.

Mr. Etter is a graduate of Drexel Institute, and has been employed as an industrial sales engineer since his graduation. He was employed for several years by The Public Service Electric & Gas Company of Newark, N. J., before entering the employ of the Philadelphia Gas Works Company from which company he resigned to accept this appointment.

J. B. Forker Dies

JAMES BENTLEY FORKER, sales manager for the past 34 years of the Oil Well Supply Co., Oil City, Pa., died at Clifton Springs,

N. Y., on Aug. 23 at the age of 60. Mr. Forker was also one of the owners and a director of the Tionesta Gas Co. at Oil City.

James T. Lynn

JAMES T. LYNN, probably one of the best known men in the gas industry, died recently in Detroit at the age of 72. Mr. Lynn attended the recent convention of the Natural Gas Department in Dallas, and apparently was in good health at that time.

Heart disease was the cause of Mr. Lynn's death.

Mr. Lynn was born in Pittsburgh. He went to Detroit in 1893. In 1907 he was made chairman of the Public Lighting Commission. He has at various times been president of the American Gas Institute, The Western Gas Association, The Michigan Gas Association, and the Natural Gas Association of America. He was also president of the National Commercial Gas Association at the time of its amalgamation into the American Gas Association, and was a leading figure in the formation of the latter Association.

Mr. Lynn was once superintendent and general manager of the Detroit City Gas Company. He has also been interested as owner and operator of a great many gas companies in many sections of the country.

C. KEMBLE BALDWIN of the Robins Conveying Belt Company died in Los Angeles on August 9. He was well known to many in the gas industry.

Celebrate Completion of Laurel, Miss., Gas Plant

ON August 17 the City of Laurel, Miss., celebrated the completion of the new gas plant and distribution system of the Mississippi Gas Company. A luncheon attended by the Rotary and Kiwanis Clubs and the Chamber of Commerce was adjourned to the plant.

The Mississippi Gas Company is managed and operated by the organization of Francis R. Weller, Inc., Washington, D. C.

A Hole in One

L. S. WILLIAMS, president of the Harrisburg Gas Company, has qualified for the "Hole-in-One Club," shooting the seventeenth hole on the Colonial Country Club golf links in one. He made the shot with a mashie and the ball carried almost 200 yards over a wide stream and tall trees.

Affiliated Association Activities

Pacific Coast Gas Association



C. H. Dickey

AT the highly successful 35th annual convention of the Pacific Coast Gas Association held at Coronado, California, September 17 to 21, Charles H. Dickey, vice-president of the Southern Counties Gas Company and director of the Pacific Lighting Corporation and of the Pacific Gas & Electric Company, was elected President of the Association.

The following officers were also elected: vice-president, Frank H. Bivens, of the Southern Counties Gas Company; treasurer, D. G. Martin, of the Pacific Gas & Electric Company; directors, John Keillor, H. L. Masser, Wm. Moeller, Jr., and W. M. Thompson.

The following will serve as directors for the second year of their two-year term: R. E. Fisher, N. R. McKee, C. R. Miller and M.

F. Wales. L. M. Klauber, the retiring president, automatically becomes a director.

Public Utilities Ass'n of Virginia

REPRESENTATIVES of gas, water, telephone, street railway, electric light and power companies from all parts of the Old Dominion, including speakers prominent in the utility industry from other sections of the country, are expected to attend the annual convention of the Public Utilities Association of Virginia, which will be held in Roanoke, Va., November 21 and 22, according to J. W. Hancock, of Roanoke, president of the association.

Mr. Hancock, who is division manager of the Appalachian Electric Power Company, also is chairman of the committee in charge of arrangements for the annual meeting. In this he is being assisted by W. J. McCorkindale, manager of the Roanoke Gas Light Company, C. B. Short, general manager of the Roanoke Railway and Electric Company, and Allyn B. Tunis, of Richmond, secretary of the association.

Demonstration of the Televox is among the features of the convention already announced.

Headquarters of the convention will be at the Hotel Roanoke.

Significance of Coal Conference

(Continued from page 604)

which the European gas man is more familiar than the American gas man. Complete gasification is one of these, and I am confident that the Europeans presenting this subject will have much to say of value. The same applies to the hydrogenation of coal.

"While mentioning hydrogenation it is interesting to note that one of the world's largest oil companies is extremely interested in this subject and certainly the gas industry cannot afford to overlook any such important development.

"It is axiomatic that modern business should know what is good for it; that is why we have research men, and pay money to specialists and analysts. It is also axiomatic, in my opinion, for all industries to know what is bad for them. The gas industry is in an enviable position today, it is true, and there are many

indications that it will enhance this position and continue on its march forward, but I feel strongly that it should watch carefully all developments which in any way may affect its growth. This does not imply that the conference will bring out facts showing developments of a harmful nature to the gas industry. What is meant is that industries today cannot afford to overlook the work of other industries. All progress affects all industries, and to put one's head in the sand is hardly good business judgment.

RESEARCH

Dr. Baker expressed himself strongly on the value of research, and was impressed when told that the American Gas Association is conducting about 75 different research programs. He said:

"Farsighted men of affairs must perceive that something more than financial

resources is necessary for commercial progress. Modern business demands two kinds of capital: money, and technical and scientific knowledge. A well organized and well directed staff of research men can achieve results in a business way which cannot be secured merely by great credits.

"America's greatest asset is its raw materials. If it is possible to develop the equivalent of these raw materials synthetically, it is obvious that the premium of the raw materials is lessened. I am personally not an advocate of synthetic meals or of other ideas which at present may seem fanciful and certainly are distinctly nebulous, but I do recommend that every individual keep closely posted on the work of the chemist. We have never made gold from baser metals economically, but we do owe much to what the ancient alchemist found out and to what the modern chemist is finding out today. The automobile was unheard of in 1890, and certainly we can expect that 1960's commonplace is unheard of today.

"By placing a suitable premium on research, present-day industry can not go wrong. I rejoice to think that in 1928 the real leaders of America and of the world realize that material wealth is as dependent on scientific effort as on natural resources.

"From my contact with the gas industry, I am confident that the industry is alive to the advantages of science. Whatever the calamity of the World War might have been, there is the certainty that the disaster of the War was the greatest incentive to scientific development. The war brought the pressure for the liquefaction of coal, and now that some progress has been made, I do not think we are over-optimistic in believing that there will be developments of vital interest to the entire human race.

"The gas industry is as keenly alive to the possibilities of coal research as any other business which uses fuel as its raw product. Because of this fact I am confident that the gas industry will grow

even more than it has. While the American gas industry has registered nothing but increases in sales in the past 22 years, the next 22 will see even greater gains, I am sure. I firmly believe that one of the most thrilling stories of industrial achievement is being written by the gas industry, and it is at conferences such as the one we are holding in November that the truth of this statement is fully realized."

McCarter Medals Presented to Indiana Men



H. A. Moore



A. L. Blissmer

HERMAN A. MOORE and AUGUST L. BLISSMER, of the Northern Indiana Public Service Co., Hammond, Ind., have joined the select ranks of those in the gas industry who wear the coveted McCarter Medal for life-saving. R. J. Mesnard, of the same company, has been awarded the McCarter Certificate. Mesnard is also a McCarter Medal winner, having received one several years ago.

Approximately 1600 employees and friends of the company were present at fitting exercises held at the company's annual picnic when Morse Dell Plain, vice-president, presented the medals and certificate. Samuel Insull, Jr., president of the company, was present.

Moore was successful in saving the life of a man overcome by gas. The victim was found in the cellar of his home, and Moore, responding to a call for help, applied the prone pressure method of resuscitation. He was assisted by Mesnard.

Blissmer saved the life of a man who had apparently attempted to commit suicide. The prone pressure method was used.

Thomas N. McCarter, president of The Public Service Corp. of New Jersey, is the donor of the medal.

NATURAL GAS DEPARTMENT

S. W. MEALS, Chairman

H. C. MORRIS, Vice-Chairman

The Long Distance Transmission of Gas

A Comprehensive and Detailed Study of the Problem,
Including a Carefully Prepared History

By HOWELL C. COOPER

Chief Engineer, Hope Natural Gas Co., Pittsburgh, Pa.; Chairman, Main Technical
and Research Committee, Natural Gas Dept., A. G. A.

THIS splendid paper on the long distance transmission of gas was prepared by Mr. Cooper as a contribution of the American Gas Association to the World Fuel Conference, held in London, England, Sept. 24 to Oct. 6.

Because this subject is an important one for both the manufactured and natural gas branches of the industry, and because Mr. Cooper has prepared such an exhaustive and authoritative paper, the A.G.A. will have reprints of it available shortly.

Space limitations prevent printing the entire paper in one issue of the Monthly. The article will be concluded in the November issue.—Editor.

THE purpose of this paper is to consider the principal matters which affect the financial results of any project involving the transmission of fuel gases over considerable distances through pipe lines.

The experience of the natural gas industry, as developed during the past fifty years in the United States, it is thought may be used advantageously as a basis for the consideration of these economic matters, because long distance transmission of a natural fuel gas is an essential part of the industry.

In 1872 a pipe line two inches in diameter was laid to the city of Titusville in Pennsylvania from natural gas wells five and one-half miles distant, and natural gas was transmitted and sold for fuel in the city. This undertaking marked the beginning of what has grown to be a great industry in America. At that period wells were being drilled throughout Western Pennsylvania, New York, Ohio, and West Virginia, in the search for oil, and since much natural gas was also found, the small enterprise at Titusville was

soon repeated and enlarged upon as to other towns and cities throughout all this region. Buffalo, Pittsburgh, Cleveland, Youngstown, Cincinnati, and Toledo, all great industrial centers, were early supplied with natural gas as fuel through the agency of transmission pipe lines extending to them from distant wells, and they are still so supplied.

The pipe lines laid for transmitting natural gas in these states between the years 1872 and 1890 did not generally exceed about eight inches in diameter. The pipe was made of wrought iron and the joints connected with screwed couplings. The pressure in the pipe lines was carried at about eighty pounds. At that period the transmission pipe lines were not of great length because of the location of gas wells with reference to the cities supplied. In 1891, the Indian Natural Gas & Oil Co. laid two parallel pipe lines eight inches in diameter a distance of 120 miles from natural gas wells drilled near Greentown, Ind., to Chicago, Ill. The pipe was made of wrought iron, connected with screwed couplings, and the gas was transmitted under an initial pressure of 525 pounds. Mechanical compression was used. This enterprise marked the beginning of long distance high-pressure transmission in the United States.

Since that time considerable development in this industry of transmitting and marketing natural gas has taken place. Much gas has been found in California, Wyoming, Texas, Oklahoma, Arkansas, and Louisiana, and is being transmitted through systems of pipe lines as large as

22 inches in diameter, and under pressures of gas as high as 400 pounds. In the Eastern States these pipe line systems extend from Cleveland on Lake Erie, as far South as Kentucky and thus transmit natural gas for distances of 350 miles from wells to markets. In the Western States some pipe line systems are in excess of 400 miles in length. In this manner 1200 billion cu.ft. of natural gas were transmitted and marketed in the United States in 1927. It is from this background of experience that the following matters are presented.

The production of natural gas is essentially a mining operation, and because of the natural difficulties which surround such industries, it is necessary to assemble a large amount of proved and prospective gas bearing territory and place it behind any project involving marketing the gas as fuel for domestic or industrial purposes in order to secure a continuous supply of gas over a long period of time.

The development of this gas reserve with the necessary wells of exploration and those required for regular production, makes necessary a large investment of money and entails heavy fixed and op-

erating charges. Therefore, to meet these charges, large volumes of gas must be sold yearly from the property, and this can only be done by marketing it as a fuel in competition with all other forms of fuel, namely, coal, oil, and manufactured gas.

In marketing natural gas from properties assembled as above described, it will be clear that the distance over which the gas may be transmitted is very definitely limited by the character of the market which it is proposed to supply. Thus a large yearly demand, coupled with a high daily load factor, and no unusually low prices for competitive fuel, will make economically possible the pipe line investment required to transmit the gas long distances. But on the other hand should any of these factors be unfavorable, transmission possibilities are materially affected.

In the following study these several factors will be considered separately.

To make the transmission subject clear to those unfamiliar with natural gas pipe lines, the following brief description of their construction is presented.

General Description of Transmission Pipe

PIPE

Until about the year 1890 nearly all of the pipe used in this country was made from puddled gray pig iron rolled into muck bar and skelp.

The demand for pipe for all purposes increased rapidly as the oil and gas industry expanded, and since the puddling of iron is very laborious and steel is cheaper in manufacture, pipe made from steel rapidly displaced iron pipe to a very large extent.

Pipe which is made from steel sheets either by the Bessemer or open hearth processes and lap welded in the usual manner generally conforms to the following physical specifications:

	Bessemer	Open Hearth
Tensile strength—lbs. per sq.in. ...	50,000	45,000
Yield point lbs. per sq.in. ...	30,000	25,000
Elongation in 8", %	20	22

Similar specifications for pipe made of wrought iron are as follows:

Tensile strength—lbs. per sq.in.	42,000
Yield point lbs. per sq.in.	24,000
Elongation in 8", %	12

This pipe is made in diameters up to 24 inches and in varying thicknesses by the use of lap welding rolls. Larger diameters are usually lap welded by the use of suitable hammers. Lap weld pipe, 16 inches and larger in diameter, is made in sections varying from 17 to 20 feet in length.

Electrically welded pipe is just now being introduced in this country to some extent. Steel high in carbon and hence of high tensile strength is generally used in making pipe by this process. This material has entered the market for pipe so recently that specifications for its manufacture have not as yet been generally adopted.

Seamless pipe has not as yet been manufactured in large diameters, such as required by present practice for large gas transmission projects.

COUPLING PIPE SECTIONS TOGETHER

For pipe lines built to transmit gas over considerable distances, present practice is to make the ends of the pipe sections plain and cut square with the length. The sections when placed end to end forming the line are connected by one of the two following methods:

(a) Welded by the oxacetylene process, or by the electric arc method, thus forming a round-about butt seam.

(b) A sleeve about seven inches long is placed over the abutting ends of the pipe and a ring of rubber held by a follower and bolts pack each end of the sleeve.

The practice of welding pipe joints together with acetylene gas (a) when pipe of low carbon steel is used has been growing steadily since about 1912 and many pipe lines of diameters 12 inches and under have been thus constructed. In 1924 one large transmission pipe line, using pipe 14", 16" and 18" in diameter, was built with sections welded together by this process, and one other similar line was completed in 1926.

The practice of welding will no doubt gradually increase and be more generally applied to large lines when mechanical means can be developed for doing welding in the field, and when methods of eliminating welding strains and providing for line expansion can be worked out.

Method (b) is now generally practiced in the construction of large diameter transmission pipe lines. The material of the rubber rings has been developed to resist deterioration from such hydro-carbon liquids as are contained in natural gas and the rubber makes a joint with the iron which is practically tight under pressures up to 400 pounds as now in use. This method of joining the pipe sections allows the pipe to move slightly as it expands or contracts through changes,

and this movement must be carefully provided for in all large and heavy lines.

CONSTRUCTION

The pipe sections are carefully laid end to end along the right of way of the pipe line and are joined together making the continuous line. A trench is dug either by hand or, where possible, by use of ditching machines, and after the sections are coupled together the pipe is lifted and lowered into the trench by means of suitable machinery. The trench is of such depth that the top of the pipe will be not less than about 24 inches below the surface of the ground. Of course, in many places where the line traverses hilly and broken country, the trench is much deeper as the pipe of large diameter can only be bent in the field to a limited extent, and always a sufficient weight of earth must be placed upon it to resist the pressure tending to force the joints apart when they are coupled together with a sleeve as in the method (b) described in the foregoing. In long transmission pipe lines gate valves are usually placed in the line spaced about ten miles apart to permit a section to be shut in for quick repair without having to drain the whole line of gas.

At those localities where the pipe line crosses swamps or rivers, a number of small lines, usually 8" or 10" in diameter, are laid in parallel and brought together in a header at each end. These lines have the sections joined together either by welding or by means of screw threads and collars. A heavy clamp is placed over each such joint and the lines are most carefully laid. In regions where the ground is continually wet or contains corrosive substances, the pipe is covered with some protective coating.

COMPRESSING MACHINERY

In compressing natural gas to pressures required for transmission, direct acting cylinder and piston type compressors are now in general use. Such compressors may be driven by almost any form of

prime mover, but general practice for this service is to connect the compressing cylinders directly to the piston rods of a cross compound steam engine, or to a single or twin gas engine, thus making each engine and compressor a complete unit.

At the compressing station, placed at the head end of the transmission line in the producing field, the gas from all the wells is gathered together through pipe lines extending in various directions. The pressure of the gas as it reaches this initial station through these lines may vary widely over periods of the day depending, of course, upon the pressure in the wells, and the volume which is being delivered to the station during any hour. At this station sufficient power is provided to compress the gas from these varying field pressures as received, to the high pressure required in the transmission line.

If the length of the transmission line—the distance from initial station to the delivery end at the market—is so great that the maximum volume of gas required per hour will not pass through the line, then one or more recompressing stations may be placed along it to increase the flow of gas. In these latter stations the range of compression in the cylinders is kept

down so as not to exceed three to one for continuous operation. This gives about peak load on the engines and is, therefore, economical of fuel. Thus suppose a pipe line of some considerable length having, say, 300 pounds absolute pressure at the field end and 100 pounds absolute pressure at the outlet end and when flowing steadily will deliver, for example, ten million cu.ft. of natural gas per day, then if a "booster" station having suitable compressing engines is placed in the middle of the length of the line and operates to reduce the pressure at that point to 100 pounds and recompresses the gas again to 300 pounds, the flow through this boosted system will be slightly more than fourteen million cu.ft. per day, providing that the pressure at the outlet end remains 100 pounds. Of course the pipe line may be divided into several such boosted sections to increase its flow if necessary.

Four-cycle gas engines are usually the type of prime movers used in the natural gas industry for driving the compressors, but there are, of course, many examples of large compressing stations using steam engines and coal fired boilers where the location of the station renders this arrangement economical.

General Consideration of Transmission Problems

MARKET DETAILS

The investment in pipe lines and compressing machinery comprising the transmission facilities of any natural gas project is largely determined by the load factor of the whole market to be served. A first step, therefore, in determining the feasibility of transporting natural gas over a considerable distance consists in finding the maximum daily demand of the whole proposed market and also the total yearly sales for all purposes.

If gas is to be sold for all domestic uses—cooking, water heating, and house heating—a most careful study must be made to determine the maximum demand of this house heating load which will be

placed on the transmission line on the coldest days in winter. An average domestic consumer in our Southern cities will require about 27,000 cu.ft. of natural gas per year for the two uses, cooking and water heating. In Northern cities this volume will be greater, possibly 30,000 to 35,000 cu.ft. The daily demand for this purpose is fairly steady in a large city throughout the year.

The house heating demand, however, depends on the competitive prices of other fuels, and upon the average temperatures throughout the year. In a paper written by P. McDonald Biddison, entitled, "Limiting Factors for Natural Gas Projects," presented at the meeting of

the American Gas Association at Dallas, Texas, May 7, 1928, the author states that studies which have been made by engineers covering some cities in our Southern states in which natural gas is used indicate that an average consumer in those particular cities uses about 16 cu.ft. of natural gas per day per degree of temperature below 65° F. for house heating.

On very cold days the demand of the whole domestic market in some cities may be $2\frac{1}{2}$ times the volume of natural gas required for that class of business on the average day, using the whole yearly demand as a basis of comparison. And also on a cold day the domestic consumer using natural gas for house heating will, in many cases, require that 70 per cent of the whole day's demand shall be delivered to him between the hours of 7:00 A. M. and 7:00 P. M.

Experience shows that the duration of the cold season, the general character of the dwellings, the earning power of the consumers, and the price of competitive fuels, all have their effect on the volume of natural gas which each consumer will use per year, particularly for house heating, and also largely determine the number of people in any community who will so use the gas. As there is no way of valuing these several factors exactly, it is recommended that a study be made of a new market, when possible, by comparing it with those existing markets which present the same general characteristics.

Turning to the industrial market, the daily load factor may be high, if there are many and diversified manufactories served, or the same may be low if the reverse of these conditions obtains. It is, therefore, necessary to give the whole matter of total sales and peak demands of a market most careful study in analyzing a natural gas project for, as will later be illustrated, the cost of transmission in most cases is vitally affected by the irregularity in market demand.

EFFECT OF LOAD FACTOR ON TRANSMISSION COSTS

The following illustrations, or examples, are here introduced to show in general the trend of changes in the investment required to be made and also the resulting operating costs, when natural gas is transported over distances varying from 75 miles to 300 miles, in volumes varying from about 9,000 million to 26,000 million cu.ft. per year, and with daily load factors varying from 65 per cent to 100 per cent.

The design of pipe line, its diameter and power arrangements chosen for each of these illustrations, is in conformity with general engineering practice in the natural gas industry at the present time.

The investment cost used in the illustrations represents about average experience as of the present day in laying long transportation pipe lines across ordinary country where no unusual difficulties are to be met.

The item, "Total Yearly Cost Item," includes:

- (a) Local field management and superintendence.
- (b) Labor for maintaining, operating and repairing the pipe line and compressing stations.
- (c) Fuel and supplies and spare equipment.
- (d) Eleven per cent on the investment to provide for retirement of investment and interest on the capital at six per cent.

It does not include:

- (e) General overheads and accounting.
- (f) Interest on working capital.
- (g) Taxes.
- (h) Sum for unusual replacements.

TREND OF TRANSMISSION COSTS—NATURAL GAS Illustration No. 1

Yearly volume delivery	9,490,000,000 cu.ft.
Average daily delivery ...	26,000,000 cu.ft.
Maximum daily delivery ..	26,000,000 cu.ft.
Load factor—daily	100%
Distance of transmission	75 miles
Diameter of pipe line	12 inches
Compressing station at field end of line	
No recompressing stations	
Investment—pipe line and station .	\$1,630,000
Total yearly cost, items (a) to (d)	
inclusive	276,000
Then, cost per M cu.ft. delivered ...	2.9 cents

Illustration No. 2

Yearly volume delivery ...	16,440,000,000 cu.ft.
Average daily delivery ...	45,000,000 cu.ft.
Maximum daily delivery ...	45,000,000 cu.ft.
Load factor—daily	100%
Distance of transmission	75 miles
Diameter of pipe line	16 inches
Compressing station at field end of line	
No recompressing stations	
Investment—pipe line and station ..	\$2,210,000
Total yearly cost, items (a) to (d), inclusive	358,000
Then, cost per M cu.ft. delivered ..	2.18 cents

Illustration No. 3

Yearly volume delivery ...	16,440,000,000 cu.ft.
Average daily delivery ...	45,000,000 cu.ft.
Maximum daily delivery ...	45,000,000 cu.ft.
Load factor—daily	100%
Distance of transmission	300 miles
Diameter of pipe line	18 inches
Compressing station at field end of line	
One recompressing station	
Investment—pipe line and stations ..	\$9,080,000
Total yearly cost, items (a) to (d), inclusive	1,313,000
Then, cost per M cu.ft. delivered ...	8 cents

Illustration No. 4

Yearly volume delivery ...	26,300,000,000 cu.ft.
Average daily delivery ...	72,000,000 cu.ft.
Maximum daily delivery ...	72,000,000 cu.ft.
Load factor—daily	100%
Distance of transmission	300 miles
Diameter of pipe line	20 inches
Compressing station at field end of line	
Three recompressing stations	
Investment—pipe line and stations	\$11,640,000
Total yearly cost, items (a) to (d), inclusive	1,832,000
Then, cost per M cu.ft. delivered ...	6.96 cents

Illustration No. 5

Yearly volume delivery ...	9,490,000,000 cu.ft.
Average daily delivery ...	26,000,000 cu.ft.
Maximum daily delivery ...	40,000,000 cu.ft.
Load factor—daily	65%
Distance of transmission	75 miles
Diameter of pipe line	14 inches
Compressing station at field end of line	
No recompressing stations	
Investment—pipe line and station ..	\$2,060,000
Total yearly cost, items (a) to (d), inclusive	350,000
Then, cost per M cu.ft. delivered ...	3.69 cents

Illustration No. 6

Yearly volume delivery ...	16,440,000,000 cu.ft.
Average daily delivery ...	45,000,000 cu.ft.
Maximum daily delivery ...	70,000,000 cu.ft.
Load factor—daily	65%
Distance of transmission	75 miles
Diameter of pipe line	18 inches
Compressing station at field end of line	
No recompressing stations	
Investment—pipe line and station ..	\$2,860,000
Total yearly cost, items (a) to (d), inclusive	472,000
Then, cost per M cu.ft. delivered ..	2.87 cents

Illustration No. 7

Yearly volume delivery ...	16,440,000,000 cu.ft.
Average daily delivery ...	45,000,000 cu.ft.
Maximum daily delivery ...	70,000,000 cu.ft.
Load factor—daily	65%
Distance of transmission	300 miles
Diameter of pipe line	18 inches
Compressing station at field end of line	
Three recompressing stations	
Investment—pipe line and stations	\$11,180,000
Total yearly cost, items (a) to (d), inclusive	1,800,000
Then, cost per M cu.ft. delivered ..	11 cents

Illustration No. 8

Yearly volume delivery ...	26,300,000,000 cu.ft.
Average daily delivery ...	72,000,000 cu.ft.
Maximum daily delivery ...	111,000,000 cu.ft.
Load factor—daily	65%
Distance of transmission	300 miles
Diameter of pipe line	22 inches
Compressing station at field end of line	
Three recompressing stations	
Investment—pipe line and stations	\$14,350,000
Total yearly cost, items (a) to (d), inclusive	2,352,000
Then, cost per M cu.ft. delivered ..	8.9 cents

Since a transmission system, to meet the requirements of any particular project, admits of variation in design as to choice of pipe diameter, quality of pipe, operating pressures, number of recompressing stations and selection in type of machinery, it is apparent that the cost figures presented in the foregoing examples, both for investment and operating charges, are to be accepted as illustrative only, and confined to systems designed in accordance with present day practice for lines of moderate length.

Considering the effect of daily load factor on the transmission costs, for a given yearly total delivery of natural gas over distances within the range of the illustrations, compare illustration No 1 with No. 5; No. 2 with No. 6; No. 3 with No. 7; and No. 4 with No. 8.

The daily load factor of 65 per cent as used in these illustrations is high for markets consisting of both domestic and industrial consumers, when fully supplied with natural gas as fuel. To obtain a load factor as good as 65 per cent in this industry requires (a) that of the whole market served a very large percentage must be composed of well diversified industrial consumers, or (b) that during the mild seasons of the year, when do-

(Continued on page 635)

ACCOUNTING SECTION

EDWARD PORTER, Chairman

F. H. PATTERSON, Vice-Chairman

H. W. HARTMAN, Secretary

IDAHO ADOPTS UNIFORM CLASSIFICATION OF ACCOUNTS FOR GAS UTILITIES

THE American Gas Association has been informed, through the Accounting Section Committee on Uniform Classification of Accounts, that the State of Idaho has adopted the uniform classification of accounts. It is to be effective Jan. 1, 1929.

In announcing the decision to adopt the classification, Will H. Gibson, President of the State of Idaho Public Utilities Commission, stated that the commission recognized the desirability of uniform classification of accounts, especially for utilities which operate in more than one state. Since the system fulfills all of the requirements of the state, it has been adopted for Idaho.

To date the following states have adopted the classification:

COMMISSIONS ADOPTED

Alabama	New Jersey
Colorado	New York
Connecticut	North Dakota
Dist. of Columbia	Tennessee
Georgia	Oregon
Illinois	Pennsylvania
Indiana	Utah
Louisiana	Vermont
Massachusetts	Virginia
Michigan	Wisconsin
Nevada	

The Uniform Classification of Accounts Committee of the Accounting Section wishes to again extend an invitation to all members to submit any problems they may have with regard to the uniform classification.

A correct listing of the personnel of the Committee to date is appended:

H. M. Brundage, Chairman, Consolidated Gas Company of New York, N. Y.; R. D. Beardsley, 545 William Penn Way, Pittsburgh, Pa.;

Harry C. Hasbrouck, H. C. Hopson, 61 Broadway, New York, N. Y.; James Lawrence, American Light & Traction Company, New York, N. Y.; E. B. Nutt, Peoples Natural Gas Company, Pittsburgh, Pa.; Edward Porter, The United Gas Improvement Company, Philadelphia, Pa.; W. A. Sauer, The Peoples Gas Light & Coke Company, Chicago, Ill.; Wm. Schmidt, Jr., Consolidated Gas Electric Light & Power Company, Baltimore, Md.; L. A. Seyffert, Ohio Fuel Gas Company, Columbus, Ohio; R. G. Soper, Dallas Gas Company, Dallas, Texas.

Information Needed

WHO says there is no romance in the gas business? Some time ago a letter came to A.G.A. Headquarters in which inquiry was made for some information which would lead to knowledge of Max Kopski.

Mr. Kopski was the head of a flourishing natural gas company in Salt Lake City in 1889 or 1890 and, according to his nephew, Otto Stabenau, was doing very well. In 1890 Mr. Kopski wrote to his family in Germany saying that he was going to visit his old home, and would leave Salt Lake City immediately and upon his arrival in New York would cable the name of the boat upon which he would travel. This letter was the last word received from him, and although diligent search was made, nothing has ever been discovered.

Mr. Stabenau has written to the American Gas Association asking for some help in the search for his uncle, and this is written with the hope that some of the "Old Timers" in the natural gas business might have some information concerning the company, which was known as the Utah Natural Gas Co., or know something about Mr. Kopski personally.

There is no record of the company after 1889, although records of the U. S. Geological Survey reports show that a small amount of natural gas was produced and sold in Utah until 1898.

Any information, no matter how meagre, will be very welcome, and can be sent to Headquarters or to Otto Stabenau, 24 Stone St., New York, N. Y.—By Mary Spear, A.G.A. Headquarters.

Two Central Illinois Company Men Get McCarter Medals



Harry Heinecke



Enos Winkler

ENOS WINKLER and HARRY HEINECKE, employees of the Central Illinois Public Service Co., were each awarded the McCarter Medal and certificate recently for saving the life of a pipe fitter who was overcome by gas. The presentation was made by F. S. Armstrong, safety manager of the company, at an employees' safety picnic at Quincy, Ill.

Winkler and Heinecke were awarded the McCarter Medal by the American Gas Association for saving the life of John Hufford.

Hufford had been working in a tunnel, and after coming to the street level, he collapsed on the pavement. Heinecke immediately started to apply the prone pressure method of resuscitation, and Winkler relieved him.

Resuscitation was carried on for 45 minutes before there were signs of life, and for one hour before the victim began to breathe without assistance. Then the patient lost consciousness again, and resuscitation was carried on for two hours before he was able to walk.

The McCarter Medal is presented by the American Gas Association through the generosity of Thomas N. McCarter, president of The Public Service Corp. of New Jersey.

Western Metal Congress to Be Held in January

TWELVE nationally known technical societies that have been important factors in the development of the industrial West are co-operating to make a success of the first Western Metal Congress, Western States Metal and Machinery Exposition and semi-annual meeting of the American Society for Steel Treating to be held in Los Angeles, Calif., Jan. 14 to 18.

Papers of vast importance to industrial development will be read at sessions of the Western Metal Congress. Participating in these will be the following technical societies: American Society of Mechanical Engineers,

American Institute of Mining and Metallurgical Engineers, California Division of Development and Production Engineering of the American Petroleum Institute, American Welding Society, Society of Automotive Engineers, Pacific Coast Electrical Association, Pacific Coast Gas Association, Institute of Marine Engineers, Metal Trades and Manufacturers Association, Chamber of Mines and Oils, National Purchasing Agents Association, and the American Society for Steel Treating.

The Idea is Fundamental in Sales

ARTHUR FREEMAN, of the Einson-Freeman Company, New York, spoke as follows at the Window Display Advertising Association convention recently:

"A great insurance salesman once said that there are only seven reasons why people do things, and he gave them as:

- One—Self-preservation
- Two—Property
- Three—Power
- Four—Reputation
- Five—Affections
- Six—Sentiments
- Seven—Tastes

"It requires little study of a man's individual situation or an entire market's general characteristics to know from the standpoint of any particular product just which appeal would meet with the least resistance and the speediest success.

"Salesmanship in the past has consisted largely of the building of a sales talk from the angle of the factory, explaining the merits of the product and showing its uses, without much regard for the individual situation of the prospect.

"A woman may buy an automobile for entirely different reasons from those which induce a man to purchase. A dealer buys goods not because he likes them, since he wants to get rid of them as soon as he buys them, but because he is interested in the profit and not in the goods.

"The salesman of the immediate future will be one who comes to talk to us about our merchandising needs, our product, our market, our advertising, our distribution and our costs—each in its relationship to the service or product which he comes to offer. And he will find that his success will be exactly in proportion to the extent to which he can show wherein his service or product can profitably fit into our business scheme of things.

"I don't believe in formulas in the sense of reducing a sales talk to memory and sending it out as a parrot-like message.

"I do believe, however, that there are certain fundamentals which never change and which if understood would greatly benefit the salesman who recognizes today that he is selling nothing at all but ideas."

PUBLICITY AND ADVERTISING SECTION

E. FRANK GARDINER, Chairman

JAMES M. BENNETT, Vice-Chairman

CHARLES W. PERSON, Secretary

First Wireless Advertisement Sent in 1912

Consolidated Gas Company of New York First Used
This Means of Advertising 16 Years Ago

SIXTEEN years ago advertising history was made when, for the first time, an advertisement was sent through the air to the steamship *Mauretania* when on her way to New York and three hundred miles off the coast of Ireland. The message that went by "wireless" to Thomas Graham, purser on the *Mauretania* and editor of the *Cunard Daily Bulletin*, a newspaper published on the steamship, read as follows:

Print following advertisement each day in *Cunard Daily Bulletin* until arrival in New York: "Mauretania passengers living in New York City by sending wireless requests to Consolidated Gas Company, New York, may have gas turned on in their homes or apartments and in readiness for use on arrival. Consolidated Gas Company, New York."

When the *Mauretania* docked on September 27, 1912, copies of the *Cunard Daily Bulletin* of September 23, 24, 25, and 26 were obtained and the next morning a large advertisement appeared in every New York newspaper, as shown by the very much reduced reproduction on this page.

Purser Graham said that never before had an advertisement come to him through the air. He first showed it to several prominent men in the smoking room where the advertisement was discussed by the room's occupants, a prominent western grain operator and the owner of five newspapers. With one accord the passengers acclaimed it as "a fine bit of advertising" and, taking confidence, the purser-editor printed the advertisement. Subsequently, the purser said, he discussed the "wireless advertisement" with the other passengers. At first Mr. Graham looked upon the message as a joke. Since that advertisement

The First "Wireless" Advertisement

Form No. 11

MARCONIGRAM

THE MARCONI WIRELESS TELEGRAPH COMPANY
IN CONNECTION WITH
THE WESTERN UNION TELEGRAPH COMPANY
RECEIVED PROMPTLY TRANSMITTED FOR ALL PORTS OF CALLING FOR THE NAME OF THE

2 New York September 26, 1912 8:30 P.M. 65/Q

TO THE MARCONI SHIP "VIA MARCONI" (SEEK FOR THE NAME AND ADDRESS OF THE SHIP) (SEEK FOR THE NAME AND ADDRESS OF THE SHIP) (SEEK FOR THE NAME AND ADDRESS OF THE SHIP)

FROM: (SEEK FOR THE NAME AND ADDRESS OF THE SHIP) (SEEK FOR THE NAME AND ADDRESS OF THE SHIP) (SEEK FOR THE NAME AND ADDRESS OF THE SHIP)

Print following advertisement each day in CUNARD DAILY BULLETIN until arrival New York:—

MAURETANIA PASSENGERS LIVING IN NEW YORK CITY BY SENDING WIRELESS REQUESTS TO CONSOLIDATED GAS COMPANY, NEW YORK, MAY HAVE GAS TURNED ON IN THEIR HOMES OR APARTMENTS AND IN READINESS FOR USE ON ARRIVAL.

CONSOLIDATED GAS COMPANY, NEW YORK.

As the "Ad" appeared in the Bulletin on the issues of September 23, 24, 25 and 26—

NAME	ADDRESS	DATE
JOHN	"Mauretania" passengers living in New York City by sending wireless requests to Consolidated Gas Company, New York, may have gas turned on in their homes or apartments, and in readiness for use on arrival.	September 23, 24, 25 and 26
EDWARD	Consolidated Gas Company, New York.	

Prompt attention given to all customers using Gas for Industrial Lighting, Heating, Cooling or other purposes

Telegraph — Telephone — Write or Call

Consolidated Gas Company of New York
GEO. B. CORTELYOU, President

was sent through the air others have followed in its footsteps, using European publications to spread industrial news abroad.

Farnham Writes on Budgets for Advertising

IN the August issue of *Printers' Ink Monthly*, there appears an article entitled "Budgeting the Advertising Appropriation," by C. F. Farnham, advertising manager of the American Stove Company.

In this article Mr. Farnham carefully explains the American Stove Company's budget system for its advertising.

Manufacturers' Conference

(Continued from page 608)

tion of research is that pertaining to the development of specific types of mechanical equipment embodying or carrying out the principles discovered by the first type of research. It is the division between these groups, I believe, where the possibilities on one hand and the limitations on the other of cooperative research must be drawn. Cooperative research in the fundamental problems of a general nature is not only highly desirable but most necessary to serve as a basis for real progress, and the findings of any industrial concern in this particular field should at once be made the property of all.

"In the matter of apparatus development the situation is somewhat different. The urge for invention or novel development must come through the financial returns which may be expected as the result of such development. Of course, after such development is made, it naturally becomes public and, if it has real novelty, it is susceptible to patent protection for a limited time after which it becomes public property. Personally, I believe that this is a most wise provision and that it has been general human experience that it is only through the incentive offered by such protection that great mechanical developments have been made. I do not believe that it is possible or practicable to make development and research along such lines cooperative. However, I do believe that it is desirable that when one company has developed a useful accessory—as for example a gas pilot—that it be made available to other companies to use on their own devices through purchase of this particular accessory from the manufacturer. There is a great advantage not only in cooperative research but in cooperative manufacturing. All possible standardized equipment of substantially the same type of design should be manufactured by one company rather than by many. There is in this a real economy in production. Different types, in so far as is possible, should not be manufactured in the same plants but by separate companies."

W. H. Rastall, of the U. S. Department of Commerce, also presented a valuable paper on research cooperation. He offered the service of the Department of Commerce for the benefit of the manufacturers and the gas industry. He carefully outlined the set up of the department and said that business can utilize the services available in Washington to their advantage.

He stated that while it is true business is at the highest level it ever has been, and the country is enjoying greatest prosperity and highest standard of living, what can be said of the future when 40 per cent of the manufacturers operate with no profit? Something must be done to help the small manufacturers, he said.

Mr. Rastall described in detail the proposed more elaborate census of manufacturers out of which it is hoped to secure information on which manufacturers and industries can base scientific selling efforts. He asked the manufacturers present to cooperate with the Bureau of Census in making available the information needed. He asked them to keep their 1929 records in such shape that when the material is collected early in 1930 there will be no trouble in securing the results which the Bureau of Census is after.

Mr. Rastall also gave some facts and figures which were of particular interest to the manufacturers. Among these was

(Continued on page 637)

Production Must move Forward!

PRODUCTION must move forward! Progressive operations tolerate no lags in the line! A single halt at any crucial point will throw a whole plant out of gear! That is why more and more industrial plants are turning to Gas for their fuel.

Gas is the fuel subject to the fewest interruptions. It is always available, always dependable, always adjusted to the means to meet the exact requirements of any production problem.

Here is the source of practically all manufacturers. In a very positive and a very important way, Gas plays its part to keep your production always moving forward.

For information about the use of Gas in your plant, inquire of your Gas Company, or write to

American Gas Association
427 Lexington Avenue, New York City



The A.G.A. advertises industrial gas in leading trade and technical papers. The program is directed by the Industrial Gas Section

MANUFACTURERS SECTION

H. LEIGH WHITELAW, Chairman

C. W. BERGHORN, Secretary

J. A. FRY, Vice-Chairman

270 Will Exhibit at A. G. A. Convention

**Manufacturers Will Show Latest in Equipment and
Appliances at Large Exhibit on Million Dollar Pier**

THERE will be 270 exhibitors at the tenth annual convention and exhibition of the American Gas Association, to be held on the Million Dollar Pier, Atlantic City, N. J., Oct. 8-12.

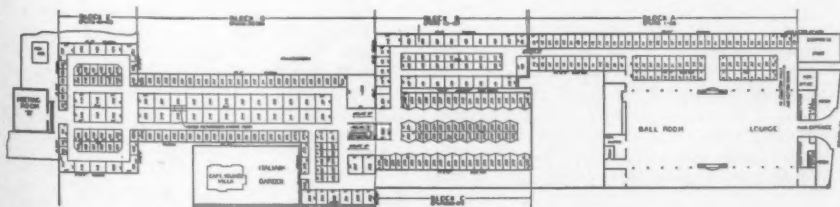
The Pier will be crowded to overflowing with the exhibits of the manufacturers. More space will be used this year than ever before, and the Exhibition will be the largest of its kind ever held in the world.

Members attending the convention are requested to consult the official convention program for the complete list of exhibitors.

The list of manufacturers and booth numbers given here is complete as of Sept. 26.

	<i>Booth No.</i>
A-B Stove Co., Battle Creek, Mich.	344
Abendroth Brothers, Port Chester, N. Y.	345
Addressograph Co., Chicago, Ill.	359, 360
Air Reduction Sales Co., New York, N. Y.	13
Akme Flue, Inc., Baltimore, Md.	12
Alpha-Lux Co., Inc., New York, N. Y.	65
Aluminate Company, Jamaica, N. Y.	15
American Aluminum Ware Co., Newark, N. J.	443
American Cast Iron Pipe Co., Birming- ham, Ala.	201
American Gas Furnace Co., Elizabeth, N. J.	61, 62

American Gas Journal, New York, N. Y.	319
American Gas Products Corp., New York, N. Y.	115
American Heater Corp., St. Louis, Mo.	447
American Meter Co., New York, N. Y.	79
American Radiator Co., New York, N. Y.	259
American Sales Book Co., Elmira, N. Y.	362
American Tar Products Co., Pittsburgh, Pa.	38
Apex Electrical Mfg. Co., Cleveland, O.	348
Austin Machinery Corp., Muskegon, Mich.	57, 58
Automatic File & Index Co., Green Bay, Wis.	361
Automatic Gas Steam Radiator Co., Pittsburgh, Pa.	14
Bailey Meter Co., Cleveland, O.	127
Barber-Greene Co., Aurora, Ill.	220
Barstow Stove Co., Providence, R. I.	428
Bartlett Hayward Co., Baltimore, Md.	45, 46
Bartlett & Snow Co., C. O., Cleveland, O.	59
Bernitz Furnace Appliance Co., Boston, Mass.	69
Bingham & Taylor Corp., Buffalo, N. Y.	18
B-Line Boiler Co., Cleveland, O.	347
Blodgett Co., Inc., G. S., Burlington, Vt.	423
Boone County Coal Corp., Philadelphia, Pa.	66
Bridge & Beach Mfg. Co., St. Louis, Mo.	426
Bristol Co., Waterbury, Conn.	37
Bryant Heater & Mfg. Co., Cleveland, Ohio	117, 118
Bullard-Davis, Inc., New York, N. Y.	124
Burroughs Adding Machine Co., Detroit, Mich.	366-371
Byers Co., A. M., Pittsburgh, Pa.	438



Layout of exhibition at 1928 A. G. A. convention, Atlantic City, N. J., Oct. 8 to 12

Caloric Gas Stove Works, Philadelphia, Pa.	205	Floyd-Wells Co., Royersford, Pa. ...	307, 308
Canadian Gas Association—Gas Journal of Canada, Toronto, Can.	241	Foxboro Company, Foxboro, Mass.	433
Carborundum Co., Perth Amboy, N. J. ...	68	Gas & Electric Heater Co., LaPorte, Ind. ...	257
Carrier-Lyle Corp., New York, N. Y.	342	Gas Machinery Co., Cleveland, Ohio	53
Celotex Company, Chicago, Ill.	254	Gas Purifying Materials Co., Inc., Long Island City, N. Y.	101
Chambers Mfg. Co., Shelbyville, Ind.	132	General Ceramics Co., New York, N. Y. ...	440
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa. ...	60	General Gas Light Co., New York, N. Y.	415, 416, 417, 418
Chapman Valve Mfg. Co., New York, N. Y.	86	General Iron Works Co., Cincinnati, Ohio	408, 409
Chicago Bridge & Iron Works, Chicago, Ill.	114	General Office Equipment Corp., New York, N. Y.	351, 352
Clark & Co., Geo. M., Chicago, Ill.	383, 384	Elliott-Fisher Division	
Cleanliness Institute, New York, N. Y. ...	419	Sundstrand Division	
Cleveland Gas Burner & Appl. Co., Cleveland, Ohio	203	Giant Mfg. Co., Council Bluffs, Iowa	51
Cleveland Gas Meter Co., Cleveland, Ohio ...	50	Glenwood Range Co., Taunton, Mass.	323, 324, 325
Cleveland Heater Co., Cleveland, Ohio ...	346	Grayson Mfg. Co., J. H., Athens, Ohio ...	420
Cleveland Trencher Co., Cleveland, Ohio	444, 445, 446	Griffin & Co., John J., Philadelphia, Pa. ...	76
Clow & Sons, James B., Chicago, Ill.	313, 314	Groble Gas Regulator Co., Anderson, Ind.	54, 55
Collier Gas Heating Co., Lynn, Mass.	425	Guardian Gas Appliance Co., Cleveland, Ohio	321, 322
Columbus Heating & Ventilating Co., Columbus, Ohio	310, 311	Harper-Wyman Mfg. Co., Chicago, Ill. ...	214
Connelly Iron Sponge & Gov. Co., Long Island City, N. Y.	222	Hays Mfg. Company, Erie, Pa.	224
Connersville Blower Co., Connersville Ind.	105	Helme & McIlhenny, Philadelphia, Pa. ...	80
Consumers Construction Co., New York, N. Y.	10	Hoffman Heater Co., Louisville, Ky.	332
Copeland-Silica Gel Corp., Detroit, Mich. ...	208-11	Hoffman Specialty Co., Inc., New York, N. Y.	429
Crandall Pettee Co., New York, N. Y. ...	135A	Holmes & Co. Ltd., W. C., Huddersfield, England	48
Crane Company, Chicago, Ill.	122	Home Incinerator Co., Milwaukee, Wis. ...	123
Cribben & Sexton Co., Chicago, Ill. ...	312, 331	Homestead Heater Co., Newark, N. J. ...	421
Crown Stove Works, Chicago, Ill.	253	Hotstream Heater Co., Cleveland, Ohio ...	204
Cruse-Kemper Co., Ambler, Pa.	41	Humphrey Co., Kalamazoo, Mich. ...	328, 329
Cutler-Hammer Mfg. Co., Milwaukee, Wis. ...	104	Hunt Co., C. W., West New Brighton, N. Y.	252
Dangler Stove Co., Cleveland, Ohio.	385, 386	Hurley Machine Co., Chicago, Ill.	439
Dearborn Chemical Co., Indianapolis, Ind. ...	120	Improved Equipment-Russell Engineering Corp., New York, N. Y.	221
Detroit-Michigan Stove Co.		International Business Machines Corp., New York, N. Y.	357, 358
Garland Division, Detroit, Mich.	107, 108	Dayton Scale Co. Division	
Detroit-Michigan Stove Co.		International Time Recording Co. Division	
Jewel Division, Detroit, Mich.	343	Tabulating Machine Co. Division	
Detroit Vapor Stove Co., Detroit, Mich. ...	213	International Combustion Engrg. Corp., New York, N. Y.	422
Direct Action Stove Co., Lorain, Ohio ...	389, 390	Combustion Engineering Corp.	
Drake Non-Clinkering Furnace Block Company, New York, N. Y.	453	Dry Quenching Equipment Corp.	
Dresser Mfg. Co., S. R., Bradford, Pa. ...	106	International Coal Carbonization Co.	
Dun-Rite Clock Device Co., New York, N. Y.	1	Lewis Mfg. Co., F. J.	
Economy Governor Co., Anderson, Ind. ...	450	Ironton Stove & Mfg. Co., Ironton, Ohio ...	326
Electric Indicator Corp., Stamford, Conn. ...	28	Isbell-Porter Co., Newark, N. J.	40
Ellis Adding Typewriter Co., Newark, N. J.	355, 356	J. & G. Brass Co., Inc., South River, N. J. ...	17
Ensign-Reynolds, Inc., New York, N. Y. ...	134	Johns-Manville Corp., New York, N. Y. ...	377, 378
Eriez Stove & Mfg. Co., Erie, Pa.	333	Johnson Gas Appliance Co., Cedar Rapids, Iowa	424
Estate Stove Co., Hamilton, Ohio	407	Kee Lox Mfg. Co., New York, N. Y.	354
Favorite Stove & Range Co., Piqua, O. ...	434	Kernit Incinerator Co., Ampere, N. J. ...	411
Fisher Governor Co., Marshalltown, Iowa ...	20	Kitson Co., Philadelphia, Pa.	6

Klimatic Clothes Dryer Corp., New York, N. Y.	448	Patrol Valve Co., Cleveland, Ohio	320
Kompak Co., New Brunswick, N. J.	337	Payne Furnace & Supply Co., Beverly Hills, Calif.	260, 261
Koppers Construction Co., Pittsburgh, Pa.	38	Peerless Heater Co., Boyertown, Pa.	112
Ko-Ray Corp., Chicago, Ill.	135B	Peninsular Stove Co., Detroit, Mich.	449
Lambert Meter Co., Brooklyn, N. Y.	75	Perfection Diaphragm Co., Inc., Brooklyn, N. Y.	7
Lamneck Co., W. E., Columbus, Ohio	452	Permutit Co., New York, N. Y.	128
Lattimer-Stevens Co., Columbus, Ohio ..	84	Pittsburgh Equitable Meter Co., Pittsburgh, Pa.	25, 26
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa	382	Pittsburgh Water Heater Co., Pittsburgh Pa.	334, 335
Lavino & Co., E. J., Philadelphia, Pa.	56	Porcelain Enamel & Mfg. Co., Baltimore, Md.	451
Lawson Mfg. Co., Pittsburgh, Pa.	133	Proudfit Loose Leaf Co., Grand Rapids, Mich.	363
Linde Air Products Co., New York, N. Y.	136	Public Service Electric & Gas Co., Newark, N. J.	300
Lindemann & Hoverson Co., A. J., Milwaukee, Wis.	207	Public Utilities Reports, Washington, D. C.	240
Lovekin Water Heater Co., Philadelphia, Pa.	119	Pyrometer Instrument Co., New York, N. Y.	206
MacGregor Valve Co., St. Louis, Mo.	256	Quakertown Stove Works, Quakertown, Pa.	230
Magee Sales Co., Boston, Mass.	427	Quick Meal Stove Co., St. Louis, Mo.	387, 388
Majestic Mfg. Co., St. Louis, Mo.	103	Reliable Stove Co., Cleveland, Ohio, 393, 394	
Maryland Meter Works, Baltimore, Md.	83	Remington Rand Business Service, Inc., Buffalo, N. Y.	372, 373, 374
McDonald & Co., D., Albany, N. Y.	81	Baker Vawter Division	
McWane Cast Iron Pipe Co., Birmingham, Ala.	126	Dalton Adding Machine Division	
Mears-Kane-Ofeldt, Inc., Philadelphia, Pa.	102	Kalamazoo Loose Leaf Binder Division	
Merco Nordstrom Valve Co., Inc., New York, N. Y.	73, 74	Library Bureau Division	
Metric Metal Works, Erie, Pa.	77, 78	Powers Accounting Machine Division	
Michell Crankless Engines Corp., New York, N. Y.	239	Rand Kardex Division	
Mid-West Incinerator Corp., Chicago, Ill.	4	Remington Typewriter Division	
Milburn Co., The Alexander, Baltimore, Md.	437B	Safe Cabinet Division	
Milwaukee Gas Specialty Co., Milwaukee, Wis.	379	Reynolds Gas Regulator Co., Anderson, Ind.	121
Mine Safety Appliances Co., Pittsburgh, Pa.	42	Richmond Radiator Co., Philadelphia, Pa.	125
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.	375, 376	Riter-Conley Co., New York, N. Y.	437A
Moore Bros. Co., Joliet, Ill.	315	Robbins Publishing Co., Inc., New York, N. Y.	3
Mueller Co., Decatur, Ill.	43, 44	Roberts Brass Mfg. Co., Detroit, Mich.	302
Mueller Furnace Co., L. J., Milwaukee, Wis.	129	Roberts Gas Burner Corp., Buffalo, N. Y.	202
Mulcare Engineering Co., Inc., New York, N. Y.	450	Roberts & Mander Stove Co., Philadelphia, Pa.	327
National Cash Register Co., Dayton, Ohio	364, 365	Robertshaw Thermostat Co., Youngwood, Pa.	305, 306
National Cast Iron Pipe Co., Birmingham, Ala.	313, 314	Robins Conveying Belt Co., New York, N. Y.	225, 226
National Lead Co., New York, N. Y.	5	Roots Co., P. H. & F. M., New York, N. Y.	71, 72
National Refrigerating Co., New Haven, Conn.	412, 413	Roper Corp., Geo. D., Rockford, Ill.	339, 340
National Tube Co., Pittsburgh, Pa.	31-36	Ruud Mfg. Co., Pittsburgh, Pa.	349, 350
New Process Stove Co., Cleveland, O., 391, 392		Safety Gas Lighter Co., Lynn, Mass.	67
Odin Stove Mfg Co., Erie, Pa.	238	Safety Gas Main Stopper Co., Brooklyn, N. Y.	52
Ohio Foundry & Mfg. Co., Steubenville, Ohio	303, 304	Sands Mfg. Co., Cleveland, Ohio	338
Oldfield Engineering Co., Chicago, Ill.	22	Scientific Heater Co., Cleveland, Ohio ..	116
Parsons Co., Newton, Iowa	236		
Partlow Corp., Utica, N. Y.	251		

Semet-Solvay Engineering Corp., New York, N. Y.	70	Walker & Pratt Mfg. Co., Boston, Mass.	330
Servel Sales Inc., New York, N. Y. ...	404-406	Welsbach Co., Gloucester, N. J. ...	316 317
Shallcross Control Systems Co., Milwaukee, Wis.	255	Western Gas Construction Co., Fort Wayne, Ind.	39
Sherwin-Williams Co., Cleveland, Ohio ..	2	West Gas Improvement Co., New York, N. Y.	47
Slattery & Bro. Inc., J. B., Brooklyn, N. Y.	410	Wetherbee-Gunn Co., Evanston, Ill.	336A
Smith Mfg. Co., A. P., East Orange, N. J.	8	Wilcolator Co., Newark, N. J.	341
Spencer Thermostat Co., Cambridge, Mass.	113	Wilder Metal Co., Niles, Ohio	309
Sprague Meter Co., Bridgeport, Conn.	63, 64	Wise Furnace Co., Akron, Ohio	442
Stacey Bros. Gas Construction Co., Cincinnati, Ohio	85	W-K-M Co., Houston, Tex.	23, 24
Stacey Mfg. Co., Cincinnati, Ohio	27	Wood & Co., R. D., Philadelphia, Pa.	49
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The following exhibits will be in the ballroom:

A. G. A. Laboratory
A. G. A. Literature & Service
Home Service Exhibit
Industrial Advertising Exhibit
Natural Gas Magazine
Sales Course Exhibit
Statistical Exhibit
Window Display Exhibit

What's In a Name?

ONE of the A.G.A. company members, a prominent manufacturer of gas plant maintenance materials, offers a reward for a suitable trade name for a refractory cement which has been used for many years by the gas industry. This cement is plastic and especially adaptable to the hot patching of retorts, also cold patching, and laying refractory brick by the "rubbed joint" method. If readers have any suggestions along this line, kindly address "Contest Editor," American Gas Association, 420 Lexington Ave., New York, N. Y.

Industrial Sales Course at N. Y. U. Is Success

MORE than 30 attended the recent course on industrial gas salesmanship offered by the American Gas Association at New York University. This course was under the direction of the Industrial Gas Section and was offered through its Committee on Cooperation with Educational Institutions, J. P. Leinroth, chairman.

Professor E. E. Ferris and other professors of the University staff conducted the course. Leading executives of the gas industry also addressed the sessions.

INDUSTRIAL GAS SECTION

F. C. MACKEY, Chairman

J. P. LEINROTH, Vice-Chairman

C. W. BERGHORN, Secretary



Photographs taken in two plants where gas is used for coffee roasting

The Part Gas Plays in Roasting Coffee

Survey of Field Made Recently in New York City
Shows Gas Leads Other Fuels

By J. B. NEALEY
American Gas Association



J. B. Nealey

tion increasing with the population, but there is also a continuous gain in the consumption per individual.

Since roasting and blending are the two most important operations in preparing coffee for the market, the selection of fuel is a very material consideration and the adoption of gas has been pretty well standardized upon throughout the industry. The use of gas not only reduces operating costs and the time element, but this fuel also lends itself to exact control thereby producing a better product. The

COFFEE has become the national beverage of America and its production and distribution forms the basis of some of our largest enterprises. As a coffee-drinking nation America stands at the head of the list and not only is the volume of consump-

popularity of gas fuel for coffee roasting is reflected in the fact that out of some 1200 coffee roasters in the United States only about 12 per cent are still addicted to the use of coal.

A survey has just been conducted in the metropolitan district of New York City, to ascertain to what extent gas was utilized in the coffee and cocoa roasting industries. This survey disclosed the fact that there were 40 concerns, in this territory, roasting coffee or cocoa, seven being cocoa roasters. Out of the 40 only six were using coal, all of the others using gas-fired equipment. Of those using raw fuel all stated that they were going to change over to gas at some future date, or when their present equipment became worn out.

The survey also brought forward the following advantages in favor of roasting with gas:

1. A single four-bag roaster of the gas-fired type will do the work of three coal roasters of the usual type.

2. The floor space occupied by the gas equipment is approximately one-third that required for coal roasters for an equal production.

3. A gas roaster will turn out three roasts per hour as against only two roasts with a coal roaster.

4. The shorter roasting period of the gas-fired equipment lowers the percentage of shrinkage materially.

5. Uniform heat is possible with gas but not with coal.

6. Coal fires fluctuate with the weather and draft but there is no varying in the temperature produced by gas from this cause.

7. Less labor is required when gas equipment is used instead of coal.

8. Cleanliness, an important factor in all food industries, can be had in a high degree with gas but not with coal.

9. If, for any reason, the roasting period is carried beyond the time limit, the gas can be turned off and the air blower left operating. This will cause rapid cooling and possibly prevent a large spoilage. The difference in the time limit cannot vary more than two or three seconds, from which the importance of the factor of control can be readily seen.

While small coffee merchants usually have their coffee roasted by a larger concern, this survey shows that a merchant handling more than 100 bags per week can make substantial savings by installing his own roaster, and conducting the operation himself. This conclusion was arrived at by considering the following facts. An individual roaster can roast coffee about five cents per bag cheaper than if he paid a commercial roaster for doing it.

The saving on 100 bags would be \$5 which, multiplied by 52 amounts to \$260, the annual saving. The cost of a roaster is about \$1000 and this installation would, therefore, pay for itself in approximately four years' time, at the rate of 100 bags weekly. Of course the period in which a roaster would pay for itself would decrease proportionately with any

increase in the amount of coffee treated up to capacity production.

Among the world famous brands of coffee are two which are blended, roasted, and packaged in New York City. The maker of one of these brands formerly roasted coffee with coal but now utilizes gas exclusively. A bank of four gas-fired roasters now does the work of 16 of the obsolete coal ovens. The new roasters are of the four-bag type.

The experience of the other company has been practically the same, as a bank of three, four-bag roasters, fired with gas, will do the work of eight coal roasters in this plant.

In some instances, firms desiring to change over from a raw to a refined fuel are not willing to scrap their present equipment. In such a case gas burners and combustion systems are supplied and the old coal burners can be equipped with them. While a conversion job of this character is a decided improvement over coal burning it is not as economical as a roaster that has been designed expressly for the use of gas.

Society of Gas Lighting Favors Simplified Calendar

AT a recent meeting of the Society of Gas Lighting, the Society endorsed the idea of the simplified calendar.

Recent newspaper dispatches state that the simplified calendar is gaining favor with many of the leading industries.

New Laboratory Building

(Continued from page 594)

It is predicted that the new building will serve as one of the most conspicuous monuments ever erected by the gas industry in the interests of its 75,000,000 customers; still further, it will definitely identify the new era of optimism concerning the future of the gas business that has been pervading the industry for a number of years. Erected for the accomplishment of an essential purpose, and of an enduring character, it should stand as one of the industry's greatest contributions to the field of modern business for all time to come.

COMMERCIAL SECTION

J. J. BURNS, Chairman

G. M. KARSHNER, Vice-Chairman

J. W. WEST, Jr., Secretary

Enrollments Now Being Taken for New Course in Domestic Gas Salesmanship

INDICATIVE of the premium the industry is placing on proper sales effort is the advance interest being shown by executives throughout the industry in the new A. G. A. course in Domestic Gas Salesmanship—to be started shortly under the auspices of the Commercial Section. The course has been called one of the most important and constructive load building moves ever developed by the industry.

The course has been designed to meet the need of the industry for better domestic sales efforts. It strikes at the root of the problem and offers gas company salesmen and others a sound training in the fundamentals of salesmanship. The information to be gained through the course will help salesmen in giving the customers the right kind of information in the right way, in explaining appliances clearly and concisely, in answering questions simply, meeting objections skillfully, and closing sales at the right moment.

To make the course of maximum value, the Association made special effort to incorporate in it the best selling information available to the gas industry at the present time. A nation-wide sales survey was made by the organization which is handling the preparation of the course, and this survey included, among other things, a study of floor and district sales methods as revealed by visits to companies, and a study of practical merchandising ideas as determined by interviews



*Will he make the sale?
The Salesmen's Training Course, offered by the Commercial Section, will help him and his brother salesmen break their quotas and do their share in building the gas load*

with executives and sales managers.

The Association is now accepting enrollments for the course and a description of what is offered is in order.

WHAT THE COURSE WILL CONTAIN

Briefly, the course will be divided into the six important phases of retail gas merchandising. These will be—

1. Finding out the customer's needs. 2. Explaining the appliance.
3. Convincing the customer. 4. Handling the difficult sale. 5. Building the gas load.
6. Reaching out for new business.

The course will cover a period of about six months, and about four weeks will be allowed for close examination and study of each unit. A combination of home study and sales meetings will be the method utilized. In this manner every salesman and contact representative of gas companies will be able to take full advantage of the course.

Each of these six units will contain:

1. A textbook for home study, fully illustrated with sales experiences, which give necessary and practical information about gas and appliances and methods of selling them. 2. A sales case which, by means of questions based on typical sales interviews, develops habits of thinking through, and of analyzing daily sales experiences. 3. A program for one or more sales meetings on each unit to be conducted by the sales manager, which provides opportunity for discussing the ideas

and methods taken up in the course, and for practice in applying them.

The texts and other material in the course have been prepared by the Business Training Corp. which has had wide experience in preparing similar material to fit the needs of other large industries.

The results to be secured from enrollment in the course are obvious. There is probably no gas company executive who does not appreciate the need for more adequate training of salesmen. If the executive can rest assured that his salesmen are thoroughly trained, his merchandising problem is lessened considerably. The Association has taken particular pains during the last six months to see that the course will answer the needs of the industry.

Detailed information regarding the course can be obtained from Association Headquarters and already a six-page letter has been sent to executives and sales managers of member gas companies and manufacturers. The enrollment fee for the course is \$25.

The course will get under way immediately after the annual convention. All gas companies are urged to make their enrollments now.

What Future for Laboratory?

(Continued from page 592)

and mixed gas research tests in improving utilization processes, I am firmly convinced that its greatest possibilities still lie in the future in the promotion of new and more convenient uses for gas.

Energy in the form of heat is one of the most essential services of human life. Even at this early date, there is a rather general public acceptance of the fact that gas offers the most convenient method of securing heat. As time goes on, the public's requirements for convenience and comfort will become higher and regardless of whether they be confined to the factory or to the home, I believe that in this expansion and improvement of our service, the Laboratory will continue to play a more and more important part.

Value of Manufacturers' Organization

(Continued from page 611)

of impressions and speculations of the sort in which I have ventured to indulge.

Finally, there is another place where such statistics and information would serve the most important purpose of all, and that is before your own eyes; for scrutiny and analysis, as the first step in the determination of the economic status of your branch of the industry. All business, if it is to prosper and progress, must subject itself from time to time to critical self-examination. It must weigh and interpret the economic significance of the statistics appertaining thereto. How, otherwise, can remedies be intelligently devised for such ills as may assail it?

The engineering and economic survey of the gas industry being carried on by the Technical Section promises to be one of the most constructive and helpful activities undertaken by the Association. I offer the suggestion that you undertake a similar survey of your branch of the industry in the belief that the facts so gathered would enable the development of a program of future activity for your Section and would be of great practical benefit to both the Section as a group, and its members individually. In every constructive step your Section takes, our good wishes and our support go with you.

Roper Will Broadcast

THE George D. Roper Corp., of Rockford, Ill., has announced that starting October 2nd it will use the radio as part of its advertising program. The Blue Network of the National Broadcasting Company will be used.

The program will continue until May, 1929. The following stations are among those that will be in the hook-up: WJZ; KYW; WJR; WBZA; WLW; KDKA; KWK; WHAM; and WBZ.

RAYMOND L. GREENE, superintendent of metropolitan works of The Brooklyn Union Gas Company, has resigned that position.

TECHNICAL SECTION

WALTER C. BECKJORD, Chairman

HARRY E. BATES, Vice-Chairman

H. W. HARTMAN, Secretary

Long Distance Transmission of Gas

(Continued from page 622)

mestic consumers use little fuel for house heating, gas must be sold in irregular but large quantities at low prices in competition with cheap fuels used for steam making, or in such employment as can accept irregular service.

It is apparent, therefore, that as the daily load factor becomes lower, the transmission costs, for any fixed yearly volume of delivery and over any fixed distance, will increase.

It may also be observed from the illustrations that in general large daily volumes of gas may be transmitted long distances at lower costs per M cu.ft. than can be accomplished in cases where small daily volumes are to be thus transmitted.

Up to the present time natural gas has not been transmitted a greater distance from wells to markets than about 350 miles, except in those cases where the transmission system serves many markets intervening between the producing fields and the most distant markets.

The present day design of natural gas transmission systems using gas pressures not exceeding 400 pounds, as before described, and using pipe up to 22 inches in diameter with comparatively thin walls, and having the joints put together with couplings, has met the operating requirements of the natural gas industry in its development up to the present time. But as projects are arising in which it is required that natural gas shall be transmitted to mean distances of 450 miles, and greater, and upon delivery shall admit of sale in competition with coal and oil at their normal prices, we find that the further lengthening of pipe lines, with recompressing stations as needed by such extensions, will not meet the economic requirements of some of these projects. Therefore, thought is being given to the possibility of using still larger diameters

of pipe for the purpose of keeping down the amount of power required in transmitting a given volume of gas over these long distances. It is of course necessary to analyze the specific conditions surrounding such projects individually to determine the effect upon total construction costs which would be brought about by the use of larger diameter pipe. Handling costs, ditching costs, river crossings, etc., all have to be considered in their relation to the character of the country through which the proposed project lies. The manufacturers also have to consider their problems in making pipe of larger diameters than those now in general use, and on the scale which would be required in very long lines. The character of the market to be served also enters each specific problem. Thus in some cases, if the market requires the delivery of a large volume of gas every day with great regularity, it may be found economical to make a large investment in the pipe and keep down compression investment, whereas, in other cases in which there are heavy peak demands for short periods, it may be found more economical to use a smaller diameter pipe line and supply power to meet these peak load requirements.

Engineers are considering also at this time the possibility of greatly increasing the pressure of the gas for very long distance transmission projects. If pressures are raised at the head, or field, end, of a long transmission line to 800 pounds, for example, in place of 400 pounds, less power for recompressing will be required in transmitting a given volume of gas per day through a pipe line of a given diameter. Or on the other hand, pipe of a small diameter could be used in the same service, provided recompressing is also used.

The obstacle to raising pressures to approximately 800 pounds in projects where large volumes of natural gas are to be transmitted over long distances lies in the fact that pipe in comparatively large diameters such as 18 inches or 20 inches must still be used to afford the necessary capacity. By the present methods of manufacture such pipe must be made from skelp and welded, and hence has a seam, and for that reason requires a large factor of safety in use, even though made of metal of rather high tensile strength. Also a very carefully made and hence expensive coupling would be necessary in joining the pipe sections in a line to use such pressures, providing that type of coupling should be chosen.

At the present time much study is being given to the development of welded joints. The work which engineers are doing on the development of welding pipe joints may solve this part of the problem.

Therefore, before it can be determined in respect to any particular project whether or not the raising of pressures to, say, 800 pounds, will reduce transmission costs below those incurred by the use of 400 pounds, it will be necessary to solve the foregoing mentioned mechanical problems and find their resultant costs.

Consideration is also being given to seamless pipe of small diameter and the transmission through it of gas at pressures as great as 1,800 pounds. The sections of pipe of this diameter may be joined together by means of standard threads and couplings, and experiments indicate that when properly made up, these joints are very tight in holding gas under these pressures. Where the particular project involves the transmission of a very large amount of gas over a very long distance, the power required for such a high-pressure line is less than the power needed for transmission at low pressures, and the whole investment required in pipe line and compressing machinery appears, after careful study, to be much less than can be accomplished with present day methods of construction.

The foregoing considerations of the possibilities of high pressures are placed here only to show the trend of thought along which engineers are working to meet the advancing requirements of the industry.

At the close of this paper is given a general description of natural gas itself. It is thought that such a description would be interesting in cases where consideration is being given to the transmission of manufactured gas. It should be noted that natural gas in transmission is usually not fully saturated with water vapors, its compression and subsequent cooling before introduction into the transmission system having brought this condition about. It is also regular practice to extract any gasoline vapors from the natural gas before entering the pipe line. Therefore the problem of keeping the transmission line free and clear of deposit is simpler in the case of natural gas than in the case of manufactured gas. This problem can only be met by carefully considering the proper location of drips in transmission lines for manufactured gas. It should also be noted that natural gas as produced in this country is in general free of constituents which would attack steel pipe, and this matter must be given consideration when transmitting any gas which does contain such constituents.

Since natural gas as at present produced contains in general 1,000 B.t.u per cu.ft., it may in some cases be more economical in transmission than manufactured gas would be in similar circumstances. This would, however, be a matter for consideration in each particular project.

Manufactured gases are at present being transmitted over considerable distances through steel pipe lines constructed and operated in the same manner as is used in the transmission of natural gas and without any mechanical difficulties.

[THE REMAINING PART OF THIS PAPER WILL BE PRINTED IN THE NOVEMBER ISSUE.]

The Engineer as a Benefactor

IN a certain German book, a sort of apologia for the technician in every field, the author, as translated by Glenn Frank, president of the University of Wisconsin, says some very handsome things concerning the part which the engineer plays in social progress. Here is a significant paragraph from the book:

"The true champions of the masses are our engineers and inventors. The inventor of the automobile has benefited horses more, has saved them from more toil and suffering, than all the world's societies for the prevention of cruelty to animals. We have no galley slaves because they have been emancipated by the inventor of the marine engine. The use of fuel oil has redeemed an army of stokers from the inferno of the stokehole. The ultimate end of technical progress is to provide every man with the comforts and conveniences that are today reserved for millionaires. Therefore the inventors and the engineers are fighting want and poverty, they are not fighting wealth; they are fighting slavery, they are not fighting rulers; their object is to universalize wealth, power, leisure, beauty, happiness. The ideal of the engineers and the inventors is not to make all mankind a proletariat, but to make all mankind an aristocracy."

Manufacturers' Conference

(Continued from page 626)

the statement that the average manufacturer can expect to sell 20 per cent of his output outside of the United States.

The manufacturers present at the conference expressed appreciation of the value of Mr. Rastall's remarks and said it was probably one of the most valuable papers which had been presented.

Howard Williams, of the Business Training Corp., then outlined the course in domestic gas salesmanship, which the Commercial Section is to start in the near future, and stressed the value of the course particularly from the manufacturers' standpoint. Since the course has been covered in detail in the MONTHLY, it will not be necessary to give further information here.

The report of the special Committee to consider the Economic Aspects of the Blue Star Seal was presented by B. J. Mullaney, vice-president of The Peoples Gas Light & Coke Co., and vice-president of the American Gas Association. Mr. Mullaney said that there was unanimity of opinion that the Laboratory is a good

thing. He mentioned three or four specific questions which the committee had considered, namely—

1. The Laboratory seal is not a trademark.

2. The seal is no indication of monetary value; it means that the appliance bearing it meets basic requirements of safety.

The committee gave major attention to the misuse of the interpretation of the seal and he called upon manufacturers for suggestions about redesigning the seal and other problems. Mr. Mullaney will make the report for his committee in an address at the general sessions at the convention, and at that time it is expected that the question of the Laboratory seal will be definitely settled.

OUR NEW MEMBERS

MANUFACTURER COMPANY MEMBERS

American Sales Book Co. Ltd., W. M. Cooper, Sales Mgr., RR Ave., 4 and Magee Sts., Elmira New York.

Gas & Electric Heater Co., C. F. Laible, V. P., 208-308 Truesdell Ave., La Porte, Ind.

Harper-Wyman Manufacturing Co., Philip G. Harper, Pres., 1364 E. 70 St., Chicago, Ill.

Michell Crankless Engines Corp., J. H. Linden, Sec'y., 19 West 44 St., New York, N. Y.

Newell Manufacturing Co., R. E. Newell, Pres., 4th St., and Depot Alley, Irwin, Pa.

Philfuels Company, R. W. Thomas, V. P., Bartlesville, Okla.

Savory, Inc., W. H. Campbell, Mgr. Spec. Div., 90 Alabama St., Buffalo, N. Y.

Vincent Valve & Heater Corp., E. T. Vincent, Treas., 93 Mass. Ave., Boston, Mass.

Midwest Stove & Enameling Co., T. A. Stoelzle, V. P. & Gen. Mgr., 1100 So. Charles St., Belleville, Illinois.

ASSOCIATE COMPANY MEMBERS

The Miller Furnace, W. E. Miller, 2165, 39 Ave., Oakland, Calif.

ACTIVE MEMBERS

Shaw, Burton Ed., Consolidated Gas Co., 408 E. 111th St., New York, N. Y.

Hartshorne, William B., Public Service Elec. & Gas Co., 80 Park Place, Newark, N. J.

Boissevain, Daniel G., Harvey Fisk & Sons, 120 Broadway, New York, N. Y.

Vaughan, Hal H., Shamrock Gas Co., Shamrock, Texas.

Trower, Ralph E., Charles H. Tenney & Co., Boston, Mass.

- Krueger, William J., Detroit City Gas Co., 192 Golden Gate St., W. Detroit, Mich.
- Schaefer, Henry E., Wheeling Steel Corp., Wheeling, W. Va.
- Thompson, A. Paul, 3961 44th St., Long Island City, N. Y.
- Bass, L. Herbert, City Gas Dept., City of Rocky Mount, Rocky Mount, N. C.
- Yocom, Ray E., The Mid East Gas Co., 5th and Main St., Zanesville, Ohio.
- Lauder, Frank W., Consolidated Gas Co., 130 E. 15th St., New York, N. Y.
- Rogers, Harry P., Astoria Light, Heat & Power Co., Astoria, N. Y.
- Luby, Clyde V., Central Illinois Public Service Co., 200 E. Main St., Hoopeston, Ill.
- Platt, Worthington E., Consolidated Gas Co., 130 E. 15th St., New York, N. Y.
- Lewis, Dwight N., United Public Service Co., 100 W. Monroe St., Chicago, Ill.
- Hoyt, William S., Erwin Wasey & Co., 844 Rush St., Chicago, Ill.
- Rhode, Gottlieb, Jr., Elmira Water, Light & R. R. Co., Elmira, N. Y.
- Satch, Madeline (Mrs.), Standard Gas Equipment Corp., Baltimore, Md.
- Knowles, James C., Pennsylvania Power & Light Co., Williamsport, Pa.
- Judd, Nelson T., Pennsylvania Power & Light Co., Williamsport, Pa.
- Heath, Lewis W., 911 1st. Ave., Williamsport, Pa.
- Garrison, C. W., The Koppers Construction Co., Pittsburgh, Pa.
- Fedderson, Will C., Wyoming Gas Co., Basin, Wyoming.
- Livingston, H. R., Hope Natural Gas Co., 545 Wm. Penn Way, Pittsburgh, Pa.
- Wilhelm, Henry P., Manhattan Rubber Mfg. Co., 997 Union Trust Bldg., Pittsburgh, Pa.
- Waechter, Stanley J., Manhattan Rubber Mfg. Co., 997 Union Trust Bldg., Pittsburgh, Pa.
- Sherman, Geo. H. W., United Natural Gas Co., Oil City, Pa.
- McDonald, W. C., United Natural Gas Co., Venus, Pa.
- Huggler, Wm., United Natural Gas Co., Van, Pa.
- Gearhart, Geo. F., United Natural Gas Co., Oil City, Pa.
- Montgomery, J. G., United Natural Gas Co., Oil City, Pa.
- Wallack, Paul C., Indian Territory Ill. Oil Co., Bartlesville, Okla.
- Peterson, H. S., Indian Territory Ill. Oil Co., Bartlesville, Okla.
- Beardmore, Herbert F., Indian Territory Ill. Oil Co., Bartlesville, Okla.
- Knight, L. R., Indian Territory Ill. Oil Co., Bartlesville, Okla.
- Weddle, O. H., Kansas Electric Power Co., Emporia, Kansas.
- Love, E. C., Kansas Electric Power Co., Leavenworth, Kansas.
- Breitung, Charles A., P. O. Box 1135, Shreveport, La.
- Graham, Stanley A., Iroquois Gas Corporation, Buffalo, N. Y.
- Magers, Kenneth, The Union Gas & Electric Co., 308 W. 4th St., Cincinnati, Ohio.
- McKee, Walter L., Southern Counties Gas Co., Pomona, Calif.
- Moore, Edw. F., Hope Engineering & Supply Co., Mt. Vernon, Ohio.
- Ott, John R., Southern Counties Gas Co., Santa Ana, Calif.
- Rhodes, George I., Ford, Bacon & Davis, Inc., 115 Broadway, New York, N. Y.
- Watts, Arthur P., Ohio State University, Columbus, Ohio.
- Shoemaker, Charles C., Jr., Board of Public Utilities, City Hall, Los Angeles, Calif.
- Newbury, Robert Chas., Ohio Fuel Gas Co., 644½ Colburn St., Toledo, Ohio.
- Boniface, John B., Public Service Elec. & Gas Co., 200 E. 5th St., Paterson, N. J.
- Good, Milton, Ephrata, Pa.
- Finley, Robert E., Dayton Power & Light Co., Washington C. H., Ohio.
- Richardson, M. P. (Miss), The Ottawa Gas Co., 35 Sparks St., Ottawa, Canada.
- Ewing, Andrew R., Associated Gas & Electric System, Oneonta, N. Y.
- Janke, Albert Karl, Kansas-Osage Gas Co., Box 645, Ponca City, Okla.
- Walden, Fred Parker, The Barrett Co., 1812 Lexington Ave., Ashland, Ky.
- Whittelsey, Charles C., Ford, Bacon & Davis, Inc., Colorado Springs, Colo.
- Haldeman, Clifford L., Hamilton Coke & Iron Co., Hamilton, Ohio.
- Schneider, Frank H., 212 Oak St., Weehawken, N. J.
- Bittner, Victor F., Peoples Gas Light & Coke Co., 122 S. Michigan Ave., Chicago, Ill.
- Bogumill, Thomas R., Peoples Gas Light & Coke Co., 122 S. Michigan Ave., Chicago, Ill.
- Novy, John J., Peoples Gas Light & Coke Co., 122 S. Michigan Ave., Chicago, Ill.
- Schick, John L., Washington Gas Light Co., 413 Tenth St., N. W., Washington, D. C.
- Shull, Leon F., Public Service Co. of Colo., 900 15th St., Denver, Colo.
- Smith, George S., Public Service Co. of Colo., 136 W. 13th Ave., Denver, Colo.
- Brown, George W., Equitable Gas Co., 215 Fifth Ave., McKeesport, Pa.
- Levine, Horace, Equitable Gas Co., 435 6th Ave., Pittsburgh, Pa.
- Ousler, George W., Philadelphia Co., 435 6th Ave., Pittsburgh, Pa.
- Smith, Herbert P., Equitable Gas Co., 435 6th Ave., Pittsburgh, Pa.
- Stone, Felix H., Equitable Gas Co., 435 6th Ave., Pittsburgh, Pa.
- McKinley, Joseph, Equitable Gas Co., 435 6th Ave., Pittsburgh, Pa.
- Ryden, E. R., Consolidated Gas Co., 408 E. 111th St., New York, N. Y.
- Roberts, Jules D., Jr., Lone Star Gas Company, 1915 Wood St., Dallas, Texas.
- Schmidt, Elmer F., Lone Star Gas Co., Dallas, Texas.
- Browne, George W., Public Service Elec. & Gas Co., 80 Park Place, Newark, N. J.
- Rowley, Melvin A., Public Service Co. of Colo., Denver, Colo.

Associations Affiliated with A. G. A.

Canadian Gas Association

Pres.—Frank Elcock, Ottawa Gas Co., Ottawa, Ont.
Sec.-Tr.—G. W. Allen, 7 Astley Avenue, Toronto.
Conv., 1929.

Empire State Gas and Electric Association

Pres.—H. O. Palmer, Empire Gas & Electric Co., Geneva, N. Y.
Chairman Gas Section—H. E. Merrill, Republic Light & Power Co., Tonawanda, N. Y.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.
Conv., 1929.

Illinois Gas Association

Pres.—J. A. Strawn, Central Light Co., Peoria, Ill.
Sec.-Tr.—R. V. Prather, 305 Illinois Mine Workers Bldg., Springfield, Ill.
Conv., 1929.

Indiana Gas Association

Pres.—T. J. Kelly, Northern Indiana Public Service Co., Fort Wayne, Ind.
Sec.-Tr.—F. W. Budd, Central Indiana Gas Co., Muncie, Ind.
Conv., 1929.

Michigan Gas Association

Pres.—F. A. Newton, Consumers Power Co., Jackson, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.
Conv., 1929.

Mid West Gas Association

Pres.—H. R. Sterrett, Des Moines Gas Co., Des Moines, Iowa.
Sec.-Tr.—A. W. Schmidt, Des Moines Gas Co., Des Moines, Iowa.
Conv., 1929.

Missouri Association of Public Utilities

Pres.—A. E. Reynolds, Springfield Gas & Electric Co., Springfield, Mo.
Sec.-Tr.—F. D. Beardslee, 315 N. 12th St., St. Louis, Mo.
Conv., 1929.

New England Gas Association

Pres.—G. W. Stiles, Portland Gas Light Co., Portland, Me.
Exec. Sec.—C. D. Williams, 41 Mount Vernon St., Boston, Mass.
Chairman Operating Div.—H. Vittinghoff, Stone & Webster, Inc., Boston, Mass.
Secretary Operating Div.—H. G. Taylor, Lawrence Gas & Electric Co., Lawrence, Mass.
Gov. Sales Div.—M. B. Webber, Marlboro-Hudson Gas Co., Boston, Mass.
Sec.-Tr. Sales Div.—J. H. Sumner, 719 Massachusetts Ave., Cambridge, Mass.
Pres. Industrial Div.—E. W. Berchtold, Boston Con. Gas Co., Boston, Mass.
Sec.-Tr. Industrial Div.—L. E. Wagner, Providence Gas Co., Providence, R. I.
Chairman Acctg. Div.—W. A. Doering, Boston Con. Gas Co., Boston, Mass.
Sec.-Treas. Acctg. Div.—Otto Price, Boston Con. Gas Co., Boston, Mass.
Chairman Manufacturers Div.—Merle E. Abbott, Glenwood Range Co., Taunton, Mass.
Sec.-Treas. Manufacturers Div.—J. H. McPherson, 7 Water St., Boston, Mass.
Conv., 1929.

New Jersey Gas Association

Pres.—H. A. Stockton, County Gas Co., Atlantic Highlands, N. J.
Sec.-Tr.—Louis Stoecker, Public Service Electric & Gas Co., Newark, N. J.
Conv., 1929.

Ohio Gas and Oil Men's Association

Pres.—J. J. McMahon, The East Ohio Gas Co., Cleveland, O.
Sec.-Tr.—Wm. H. Thompson, 811 First National Bank Bldg., Columbus, O.
Conv., 1929.

Oklahoma Utilities Association

Pres.—L. W. Scherer, United Telephone Corp., Yale, Okla.
Mgr.—E. F. McKay, 1030 Petroleum Bldg., Oklahoma City, Okla.
Conv., March 12-14, 1929, Oklahoma City, Okla.

Pacific Coast Gas Association

Pres.—C. H. Dickey, Southern Counties Gas Co., Los Angeles, Calif.
Exec. Sec.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.
Conv., 1929.

Pennsylvania Gas Association

Pres.—Mark Pendleton, Pennsylvania Gas & Electric Co., York, Pa.
Sec.-Tr.—Geo. L. Cullen, Harrisburg Gas Co., Harrisburg, Pa.
Conv., 1929.

Pennsylvania Natural Gas Men's Association

Pres.—George W. Ratcliffe, Columbia Gas & Electric Corp., Pittsburgh, Pa.
Sec.-Tr.—E. J. Stephany, Equitable Gas Co., Pittsburgh, Pa.
Conv., 1929.

Southern Gas Association

Pres.—Roy A. Zeigler, Jacksonville Gas Co., Jacksonville, Fla.
Sec.-Tr.—J. P. Connolly, 141 Meeting St., Charleston, S. C.
Conv., 1929.

Southwestern Public Service Association

Pres.—W. H. Burke, Stone & Webster, Inc., Houston, Texas.
Chairman Gas Section—R. A. McNees, San Antonio Public Service Co., San Antonio, Texas.
Sec.—E. N. Willis, 403 Slaughter Bldg., Dallas, Texas.
Conv., 1929.

The Public Utilities Association of Virginia

Pres.—J. W. Hancock, Roanoke, Va.
Sec.—A. B. Tunis, 301 East Grace St., Richmond, Va.
Conv., Nov. 21-22, 1928, Roanoke, Va.

Wisconsin Utilities Association

Pres.—C. R. Phenicie, Wisconsin Public Service Corp., Green Bay, Wis.
Exec. Sec.—J. N. Cadby, 432 Broadway, Milwaukee, Wis.
Conv., 1929.

Tenth Annual Convention of the American Gas Association
Atlantic City, N. J. October 8-12, 1928

Employment Bureau

(Address All Communications to Key Number)

SERVICES REQUIRED

GAS ENGINEER: Company manufacturing gas plant apparatus has an opening for a gas engineer. Must be familiar with water gas plant operation and apparatus. About 30 to 35 years of age. Give detailed experience and salary expected in applying. Address A. G. A.

Key No. 0117.

WANTED—Gas Sales Engineer experienced in application of gas, particularly in industrial processes. Address American Gas Association stating age, experience and salary desired.

Key No. 0118.

CONSTRUCTION ENGINEER—who has had experience in gas mains work is required by a holding company for a building of a new plant in the South. All applicants are required to state full qualifications and salary requirements in first letter. Address A. G. A.

Key No. 0119.

WANTED—Superintendent experienced in design and production gas ranges and heaters for new company in Southwest. Also need sales manager. Can acquire financial interest but not essential. State fully experience, qualifications and expected salary. Box Address A. G. A.

Key No. 0120.

WANTED—By large producing coal and coke company. Combustion Engineer familiar with gas, by-product plant and boiler operation, to cooperate with Sales Department. Prefer man with experience in New England and Eastern Territories. State reference and detail experience. Address A. G. A.

Key No. 0121.

GAS SALES ENGINEER—Large Eastern Utility Company desires engineering graduate, preferably with experience in application of gas to industrial processes. Please state age, education, experience, and salary desired. Address A. G. A.

Key No. 0122.

WANTED—Young gas engineers for Company in Middle West, with some experience on either gas plant operation or distribution or both. Should be technical graduates, out of college at least two or three years. Opportunities excellent. Address A. G. A.

Key No. 0123.

PROGRESSIVE, well organized and equipped industrial gas department in the Middle West has an opening for an ambitious engineer. Advise age, experience and salary desired. Address A. G. A.

Key No. 0124.

WANTED—Technically trained and experienced gas distribution engineer to assist gas department superintendent. Should be capable of designing and supervising installation of high- and low-pressure systems. Prefer man who has had experience in reconstructing distribution systems for increased capacities required by change from manufactured to natural gas. Address A. G. A.

Key No. 0125.

WANTED—Gas Engineer—Must have technical training and be experienced in small gas plant operation and design, also design of distribution systems. State salary and give complete experience first letter. Address A. G. A.

Key No. 0126.

DISTRICT MANAGER for gas utility.—In district having a manufacturing plant, transmission mains and 3500 meters. In Middle West. Must be a man capable of managing office and local affairs, with a knowledge of Production and Distribution. Address A. G. A., enclosing photograph, and stating fully age, qualifications, previous employment, references, and salary requirements.

Key No. 0127.

INDUSTRIAL GAS ENGINEER—Metallurgical or chemical engineer with sales experience and knowledge of industrial furnace and other heating processes wanted for promotion of industrial gas sales by Eastern Public Utility Company. Address A. G. A.

Key No. 0128.

SERVICES OFFERED

GAS DISTRIBUTION FOREMAN desires to change his position. Experienced in laying mains and services on both high- and low-pressure, good man on governors, can weld pipe. Also considered a first-class fitter on automatic, storage, tank water heaters, house heating systems, and other appliances. Will start as fitter or welder if there is chance for advancement. Address A. G. A.

Key No. 250.

EXPERIENCED—"Employee and Public Relations Man." Well grounded in knowledge of public utility organization business. Deeply interested and specially experienced in all work pertaining to public and employee relations work. Capable of executive position of responsibility. Address A. G. A.

Key No. 256.

TECHNICAL MAN now employed desires new location. 38 years of age. 16 years' experience in coal and water gas manufacture, sales and distribution; also one year's experience with a coal company sampling coal in mines, from cars and special research work. Address A. G. A.

Key No. 259.

STUDENT ENGINEER desires position with gas company where he can finish his course and with opportunity for advancement. Address A. G. A.

Key No. 260.

HOUSE HEATING MANAGER—Desires a change from present location. Thoroughly experienced in gas heating and also gas refrigeration. Technical graduate, 26 years old. Single. Available within reasonable length of time after notice is given to present employers. Address A. G. A.

Key No. 262.

CHEMICAL ENGINEER—38 years of age—15 years' experience in water and Coal Gas Plant operation, construction, distribution, and By-Product Plant work, desires connection as Gas Engineer with a holding company, or large individual gas company. Address A. G. A.

Key No. 265.

WANTED—Position as manager of a small gas company or assistant superintendent of a larger company, by practical man, 36 years old. Married. 12 years' experience including water gas plant operator both high and low pressure, also all branches of distribution. Best of references. Address A. G. A.

Key No. 266.

GAS ENGINEER with twenty years' wide, practical experience in the design, construction and operation of coal, water, coke oven, and natural gas plants and distribution systems located in all parts of the U. S. A., is desirous of an opportunity in a similar capacity with consulting engineer or holding company. Experience covers large, medium and small properties. Technical education. Address A. G. A.

Key No. 268.

WANTED—Position as manager of industrial department as well as house heating, commercial, hotel and restaurant work. Now with large company in above capacity. Middle age, good experience and reference. Can handle large job. Address A. G. A.

Key No. 269.

MANAGER OR GENERAL SUPERINTENDENT—25 years' experience in the construction, manufacture, distribution, valuation, public relations, and sales. Both coal and water gas, high- and low-pressure. Age 40 and married. Good references. Address A. G. A.

Key No. 270.

SALES PROMOTION and advertising man is seeking new connection. Experience covers every phase of the business—distribution, engineering, construction, management, and merchandising. Since World War has devoted all time to advertising and merchandising, and has had experience with agency and newspaper. Desires position with gas, combination, or manufacturer company. Address A. G. A.

Key No. 271.

ENGINEER with nineteen years experience in carbureted water gas manufacture and proven record for efficiency and organization. Address A. G. A.

Key No. 272.

EXECUTIVE, graduate engineer, 15 years experience, construction, operation, management, mostly electric light and power public utilities. Schooled by a financial leader of the industry, especially in reduction of operating expenses. Knowledge of state regulatory requirements. Would be interested in holding company appointment, preferably salary plus percentage of effected savings per annum. Address A. G. A.

Key No. 273.

INDUSTRIAL GAS SALES ENGINEER—A large operating company has an immediate opening for an industrial gas man with some experience. Address A. G. A.

Key No. 274.

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